Lucent Technologies

User's Guide

CAJUN P120

10/100/1000 STANDALONE SWITCH

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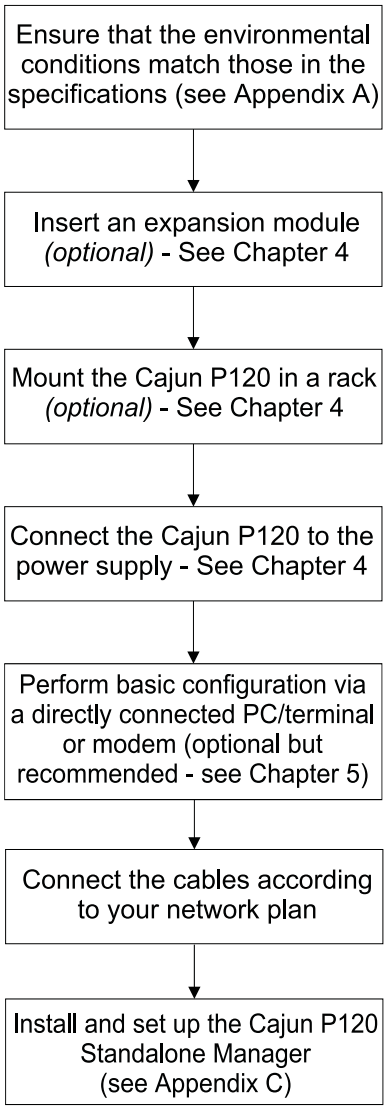
Lucent Technologies
Bell Labs Innovations

Quick Start

This section provides an overview of the steps required to get your Cajun P120 up and running. Please refer to the relevant sections in the User's Guide for further details.


Ensure that the environmental conditions match those in the specifications (see Appendix A)
Insert an expansion module *(optional)* - See Chapter 4
Mount the Cajun P120 in a rack *(optional)* - See Chapter 4
Connect the Cajun P120 to the power supply - See Chapter 4
Perform basic configuration via a directly connected PC/terminal or modem (optional but recommended - see Chapter 5)
Connect the cables according to your network plan
Install and set up the Cajun P120 Standalone Manager (see Appendix C)

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Chapter 1

Overview

The Cajun P120 is a standalone 10/100 Mbps Ethernet workgroup switch with a range of optional expansion modules that provide additional Ethernet, Fast Ethernet and Gigabit Ethernet connectivity.

The Cajun P120 is fully compatible with IEEE standards for VLAN Tagging, Gigabit Ethernet, flow control, priority queuing and LAG (Link Aggregate Grouping - also known as Trunking). The full standards-compliance, combined with auto-negotiation (10/100) makes expanding your network to match your company's growing needs "plug and play" simple.

Summary of Features

- Basic module providing 24 x 10/100BaseTX ports
- Expansion modules:
  - 2 x 1000Base-SX ports named Cajun X120S2
  - 2 x 1000Base-LX ports named Cajun X120L2
  - 1 x 1000Base-SX ports named Cajun X120S1
  - 1 x 1000Base-LX ports named Cajun X120L1
  - 2 x 100Base-F ports named Cajun X120F2
  - 8 x 10/100Base-TX ports named Cajun X120T8
  - 2 x Gigabit GBIC named Cajun X120G2
  - 2 x 1000BaseT named Cajun X120GT2 (future).
- Full and half duplex on all 10/100 and 100 Mbps ports
- 2 fans included for redundancy
- RS-232 interface (RJ-45) on front panel (for Terminal set-up)
- RS-232 interface for SLIP on back panel
- Standard Auto-Negotiation advertising the following set of capabilities: 10/100, HDX/FDX
- Support for Port Partition mode
- Back Pressure in HDX mode, activated through Technician CLI only (default is OFF)
- OpenTrunk™ (Link Aggregation Grouping). Up to four trunks can be operational at a time – three groups of up to eight 10/100Base-T ports and one on the expansion modules (two 1000Base-X, two 100Base-FX or up to eight 10/100Base-TX ports on expansion modules), based on one Base-Port per-LAG.
- Per port VLAN number allocation from VLAN number 1 to 3071
- Possibility to assign a dedicated VLAN for the agent, from 1 to 3071, for creating a virtual side band port for management

- VLAN-Tagging modes: STD IEEE 802.1Q-Tagging. The product identifies and supports 3071 tagged VLANs.
- Both Priority-per-Port and Priority-per-Packet (by 802.1p) are supported
- Support for IEEE 802.1D standard Spanning Tree Algorithm (STA)
- Port Mirroring support (a single source-destination pair active at a time), and copying both Rx and Tx port traffic from a source port into the destination port.
- Link Redundancy support – up to 4 pairs
- Aging of MAC addresses
- Built-in SNMP Agent
- Cajun P120 Manager (stand-alone SNMP management) is provided with the unit without the need for a software management umbrella suite
- Managed by CajunView™ and CajunView Plus
- Supports secure Telnet (2-level password access)
- MIB II: System, Interface, SNMP
- Bridge MIB
- IGMP snooping allows dynamic Multicast filtering
- RMON 4 groups: Statistics, History, Alarm, and Events
- Fully featured CLI support
- Port Security
- Configuration Upload/Download activated via CLI and/or Update Master application
- SMON support: VLAN statistics, Priority statistics, Copy port configuration

Cajun P120 Functionality

This section describes many of the functions that are supported by the Cajun P120 modules. For the default settings refer to the ”Default Settings” section.

Switched Ports

Switching provides high performance by confining traffic between any pair of ports to a single path in the fabric, allowing other traffic to move on other paths. The Cajun P120’s high performance is based on the internal high speed switching fabric (and a separate control bus) that prevents blocking. The 24 internal ports and expansion modules inserted into a Cajun P120 enclosure form a single switching fabric that communicates over that internal high speed switching fabric.

A Cajun P120 switch is functionally equivalent to a standard IEEE 802.1D multi-port bridge. It learns source MAC addresses on the fly and stores them, along with the source port, in a large internal CAM. The efficient forwarding process is based on the information in the CAM. The Cajun P120 can age CAM entries by erasing the entries that have not been recently used.

Unicast frames that enter any switched port are stored and forwarded to the specific destination port, thus providing a high-performance path through the switching fabric. Unknown, Multicast/Broadcast frames are flooded to all ports in the same VLAN to ensure that they arrive at the proper destination. Frames with errors are discarded to prevent error flooding.

The Cajun P120 Ethernet ports are 10/100 Mbps auto-negotiating. The Cajun P120 expansion module ports are 10/100Base-TX, 100Base-FX, 1000Base-SX or 1000Base-LX.

Each port is an independent switched port and has the availability of the whole media bandwidth. The ports are grouped internally. Frames whose source and destination addresses are in the same group will stay local to that group, thus not loading the switching fabric at all. The Cajun P120 forwards frames that are not local to their proper destination through the switching fabric to the end stations, in a mode transparent to the end stations.

Each port may be enabled or disabled by either management, the Spanning Tree Algorithm (STA) - IEEE 802.1D, or due to the port partition state of the link.

Layer 2 Security

The security function detects packets of unknown origin, prevents them from entering the switch, and alerts the Device Manager in case of such intrusion attempts. Once a station is registered in a Secured port address table it cannot communicate via any other port. However, if such a station does try to communicate via another port, the management will not receive an intrusion detection warning.

The security commands are available in the Cajun Campus CLI, Legacy CLI or via the Standalone Manager.

Virtual LANs

A Virtual LAN (VLAN) is a group of LAN stations that communicate as if they were on the same physical segment even though they are located on any port throughout the network. The main purpose of VLANs is to confine Multicast and broadcast traffic to particular parts of the network, reduce potential problems such as broadcast storms and enhance overall performance. Virtual LANs also simplify adds, moves, and changes throughout the network, ensuring a higher level of security.

Cajun P120 allows the network administrator to superimpose a Virtual LAN structure over the switching fabric by assigning Cajun P120 ports to VLANs. Initially, all Cajun P120's ports are assigned the IEEE 802.1Q Default VLAN (VLAN=1), thus enabling the users to communicate with all other users immediately after the physical connection is established.

Port-based Vlans

Port-based VLANs are created by assigning the Cajun P120 port to VLANs. All the stations connected to that port are members of this VLAN. The VLAN value which can be set per port is 1-3071 (only values 1-255 can be set in Version 1.0). All the untagged packets are mapped to the Port VLAN.

VLAN/Priority Tagging

Cajun P120 VLANs may span multiple switches. The VLAN information is conveyed by one switch to the other by tagging. The Cajun P120 uses the standard IEEE 802.1Q tagging format, thus assuring interoperability with third party switches that support the standard.

Ports that connect to other Cajun P120 switches, to third party switches, or to stations that are 'VLAN aware', should be configured to support tagging.

The priority field in the Tag is also supported, and tagged packets are forwarded to the line with the priority value.

Full Duplex

The Cajun P120 supports full duplex mode on all ports. When both the Cajun P120 port and the station at the other end of the link are configured to full duplex, then frames may be transmitted and received simultaneously which doubles the bandwidth available on the link.

Auto-negotiation

Auto-negotiation is a protocol between two link partners that enables a port to advertise its transmission rate and duplex mode to its partner. Both ports then operate at the highest common denominator between them. This saves you from having to configure the Cajun P120 10/100BASE-TX ports' speed and duplex mode to match that of the connected device.

On 1000Base Expansion Sub-module ports, Auto-negotiation controls the Flow Control Mode (Symmetric/Disabled).

Note: Auto-negotiation works only when both link partners are set to auto-negotiation mode. If you connect a NIC (or a Cajun P120 Uplink-100 port) that does not support autoneg (or autoneg disabled) to a Cajun P120 port, then we recommend that you manually set both the P120 port and the NIC to the same speed and duplex mode.

Port Mirroring

The Cajun P120 has a built-in "mirroring" capability, that allows forwarding of all the traffic to/from specific "copy source" to a "copy destination" (also called a probe-port or sniffer-port), excluding errors and frames with errors.

When you require detailed information about the traffic at a particular port, rather than attaching an expensive analyzer to each port (or moving such a probe from port to port), the network administrator may attach an external probe to any Cajun P120 port defined as a destination port and analyze any switched port by mirroring its Rx/Tx traffic to that destination port.

Port mirroring should be activated on ports that belong to the same VLAN.

FEFI

The Cajun P120 supports FEFI (Far End Fault Indication) on the 100Base-FX ports. This enables the Cajun P120 to detect and report a link failure even if it is only a Tx line failure (while the Rx line is still OK).

When a 100Base-FX port receives a FEFI indication, a switchover to a redundant link occurs, if there is one assigned to this port. If the port is part of a LAG, then the traffic from this link will be moved to the other links of the LAG, until the link's fault status is corrected.

Address Aging

The Cajun P120 supports the aging of addresses in the CAM table.

Spanning Tree

The Cajun P120 implements the IEEE 802.1D Spanning Tree (SPT) algorithm in order to allow backup paths and prevent loops throughout the Physical LAN. You should avoid using Spanning Tree when redundant links are defined or Security is activated.

Redundant Links

A redundant link (or resilient link) enables you to protect critical links and prevent network downtime if that link fails. Setting up redundancy ensures that should a main link fail, a standby duplicate link will immediately and automatically take over the task of the failed link.

You may set a link (between two switched ports) that will only become operational when the primary link is down. Up to four redundant link pairs can be configured for each switch.

Avoid using redundant links when Spanning Tree or Security are enabled.

Congestion Control (Flow Control)

Congestion control is a mechanism designed to reduce the loss of frames. In full-duplex mode the Cajun P120's congestion control conforms to the IEEE 802.3x (both sides must conform to this Standard), using PAUSE packets to stop and auto-restart the transmission of the source of the congestion.

In 10/100M half duplex mode, the Cajun P120 supports forward pressure and backpressure. These mechanisms reduce the load on the switch and free its buffers more rapidly without frame loss.

Forward pressure helps to free the switch's transmit buffers more quickly by limiting the maximum backoff time that a station waits before transmitting after a collision.

Backpressure prevents frame loss by causing a carrier sense on the segment when a frame to be received cannot be handled by Cajun P120 because its input buffer is full.

On 1000Base Expansion Sub-module ports, Auto-negotiation controls the Flow Control Mode (Symmetric/Disabled).

Link Aggregation

Link aggregation (or a trunk link) is used to increase bandwidth by connecting two devices, switches or stations via multiple point-to-point links. Link aggregation also makes the connection more resilient since traffic on a failed link is supported by the other link(s) in the Link Aggregation Group (LAG). LAG implementation ensures traffic load balancing between the links of the LAG and allows load sharing for resiliency if one of the LAG links fails.

Traffic is distributed between the ports according to the packets' addresses, which are learned on the LAG ports using the Round-Robin algorithm. The session's order is retained at all times. There is no possibility of Broadcast loops occurring in a LAG. The LAG is considered a single logical port for the switch and its functionality, including the Spanning Tree Protocol (STP), where BPDUs are sent only through one of the LAG ports.

Early Packet Drop (HOLB-P)

This feature prevents incoming frames from being forwarded to ports that are blocked. Although this leads to a loss of frames, it prevents the entire switched from becoming blocked.

Priorities

Priorities for queuing may be established to enhance the Quality of Service (QoS). Each port can be configured for high or low priority. Priority is also supported using the priority field in tagged packets. The Cajun P120 supports port-based priority and Standard IEEE 802.1p tagging.

IP Multicast Filtering

IP Multicast allows you to send a single copy of an IP packet to multiple destinations and can be used for various applications including video streaming and video conferencing.

The Multicast packet is forwarded from the sender to the recipients, duplicated when needed by routers along the way and sent to multiple destinations such that it reaches all the members of the Multicast group. Multicast addresses are a special kind of IP addresses (class D), each identifying a Multicast group. Stations join and leave Multicast groups using IGMP. This is a control-plane protocol through which IP hosts register with their router to receive packets for certain Multicast addresses. In addition, routers support one or more Multicast routing protocols (e.g. DVMRP, PIM) that construct Multicast delivery trees on which the Multicast traffic is forwarded.

On LANs, IP Multicast packets are transmitted in MAC Multicast frames. Traditional LAN switches flood these Multicast packets like broadcast packets to all stations in the VLAN. In order to avoid sending Multicast packets where they are not required, Multicast filtering functions may be added to the Layer 2 switches, as described in the IEEE standard 802.1D (802.1p). Layer 2 switches capable of Multicast filtering send the Multicast packets only to ports connecting members of that Multicast group. This is typically based on IGMP snooping, GMRP or CGMP.

Switch Management

You can configure and manage the Cajun P120 using either the Standalone Cajun P120 Manager supplied (see the *Cajun P120 Standalone Manager User Guide*), CajunView, or the text-based Terminal Emulation (see the ”Terminal Emulation” chapter). Access to Terminal Emulation is via either a serial connection or Telnet.

SNMP Agent

The Cajun P120 is managed through SNMP, either in-band (by connecting the manager to any LAN port) or out-of-band using the SLIP port.

The Cajun P120 supports two types of MIBs (Management Information Bases): proprietary MIBs and standard MIBs.

Cajun P120 Software

The Cajun P120 software is firmware running on the Cajun P120 supervisor engine. The software provides support for the switch modules and their features. You may occasionally need to update the software to a newer version to support new hardware expansion modules or increase functionality. Download is available from the Download Manager (part of the Cajun P120 Standalone Manager) or by using the TFTP process for updating the software - both are described in Appendix B, “Software Download”.

Under normal conditions, the Cajun P120 boots up from its Cajun P120 switching software. However, should that software become damaged, the Cajun P120 may bootup from a basic version of the software which is stored in a separate secured bank.

Configuration Upload/Download

This function provides ease of configuration. The user can download a configuration file to all switches or simply copy the configuration of one switch to another.

Loading the configuration file is achieved either via Cajun Campus CLI, Legacy CLI or via the Update Master.

Cajun P120 Front and Back Panels

Cajun P120 Front Panel

In addition to the connectors, the Cajun P120 front panel contains status LEDs and control buttons which provide at-a-glance information.

The Port LEDs display information for each port according to the function selected by the left and right switches. The parameter you select is shown by one of the Function LEDs. For example, if the COL LED is illuminated, then all Port LEDs show the collision status of their respective port. If you wish to select the LAG (Trunk) function, then press the Right button until the TRK Function LED is lit; if you then wish to select Rx then press the Left button several times until the Rx function LED lights ON.

The LEDs, controls and RJ-45/CONSOLE connector (bottom right) on the Cajun P120 front panel are shown below in Figure 2.1 and Figure 2.2 and described in Table 2.1. Figure 2.3 shows the power supply and DB-9 connectors at the back of the switch.

Figure 2.1 Cajun P120 Front Panel

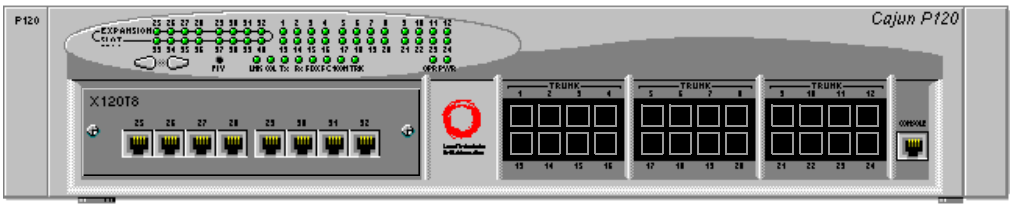


Figure 2.2 Cajun P120 LEDs

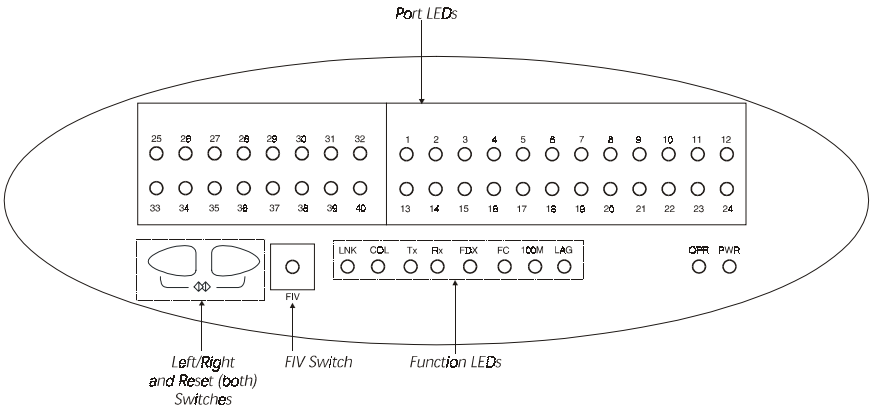

Port LEDs
25 26 27 28 29 30 31 32
33 34 35 36 37 38 39 40
1 2 3 4 5 6 7 8 9 10 11 12
13 14 15 16 17 18 19 20 21 22 23 24
FIV
LNK COL Tx Rx FDX FC 100M LAG
OPR PWR
Left/Right and Reset (both) Switches
FIV Switch
Function LEDs

Figure 2.3 Cajun P120 Back Panel

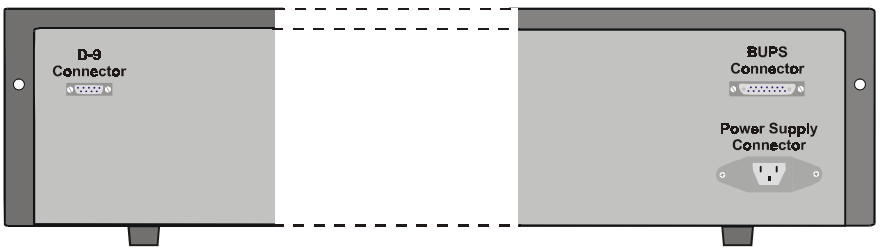


Table 2.1 Cajun P120 LED Descriptions

LED Name	Description	LED Status
PWR	Power status	OFF – Power is off
		Blink – P120 BUPS power supply is active
		ON – Internal P120 power supply is active
OPR	CPU operation	OFF – CPU is booting
		ON – CPU boot operation completed
The following Function LEDs apply to ports 1 to 40		
LNK	Port status	OFF – • Port disabled • Port enabled and the link is down
		ON – Port enabled and link is OK

Table 2.1 Cajun P120 LED Descriptions (Continued)

LED Name	Description	LED Status
COL	Collision	OFF – No collision or FDX port
		ON – Collision occurred on line
Tx	Transmit to line	OFF – No transmit activity
		ON – Data transmitted on line
Rx	Receive from line	OFF – No receive activity
		ON – Data received from the line
FDX	Half/Full Duplex	OFF – Half duplex mode
		ON – Full duplex mode
FC	Symmetric Flow Control	OFF – Asymmetric Pause mode is *enabled* for the Gigabit Ethernet port or Flow Control is *disabled* for the 10/100 port.
		ON – Flow Control (Symmetric Pause only) mode is enabled for the 10/100 or Gigabit Ethernet port.
100M	10/100 Mbps	OFF – 10Base-T port or 1000Base-X port
		ON – 100Base-TX or 100Base-FX port
LAG	Link Aggregation Group (LAG or Trunking)	OFF – No LAG defined for this port
		ON – Port belongs to a LAG

Note: All LEDs are lit during a reset.

Table 2.2 Cajun P120 <- -> Select buttons

Description	Function
Left/Right	Individual – select LED function (see table above)
Reset	Press both Right and Left buttons together for five seconds
FIV	Force Initial Version – boot from initial version of the Cajun P120 software, from Bank A (see Note below).

Note: To perform "Force Initial Version" reset the switch while pressing the FIV button by using an opened paper clip or other pointed object.

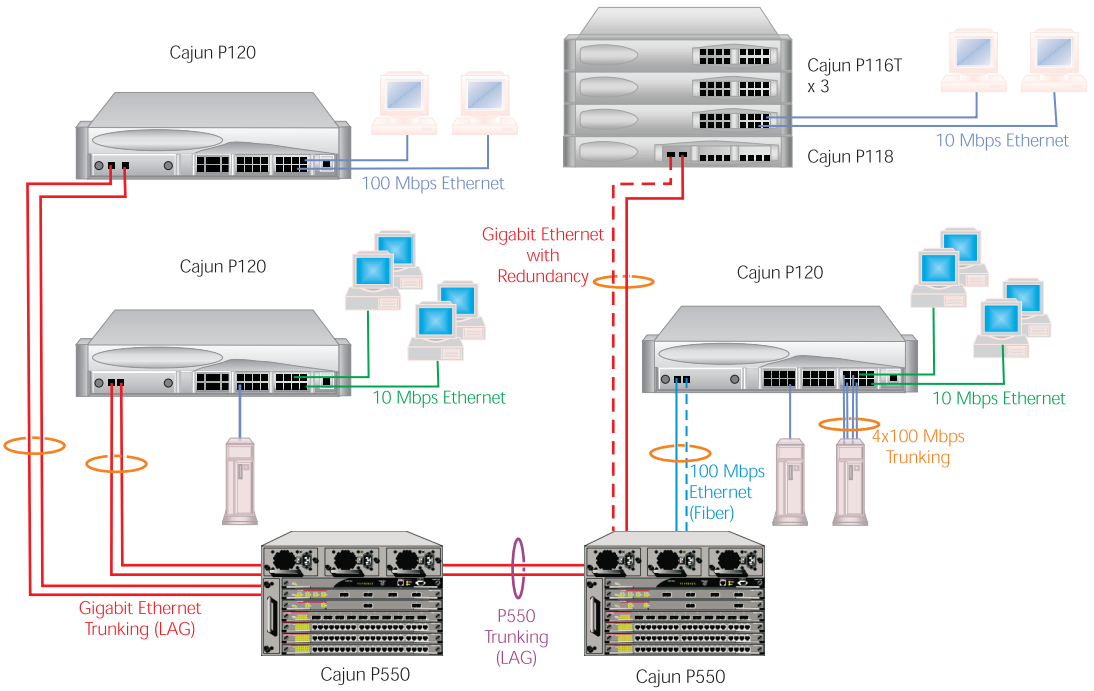
Applications

The following sections describe typical applications for the Cajun P120 in a network with other Cajun Campus products.

Application 1

This application shows two Cajun P120 switches connected to another P120 switch and a P110 stack via a Cajun P550 backbone. On the left side of the drawing, the Cajun X120S2 SX Expansion modules in the P120 provide a Gigabit Ethernet link with redundancy to the Cajun P550. On the right, the connection is via the Cajun X120F2 100 Mbit Fiber Expansion module.

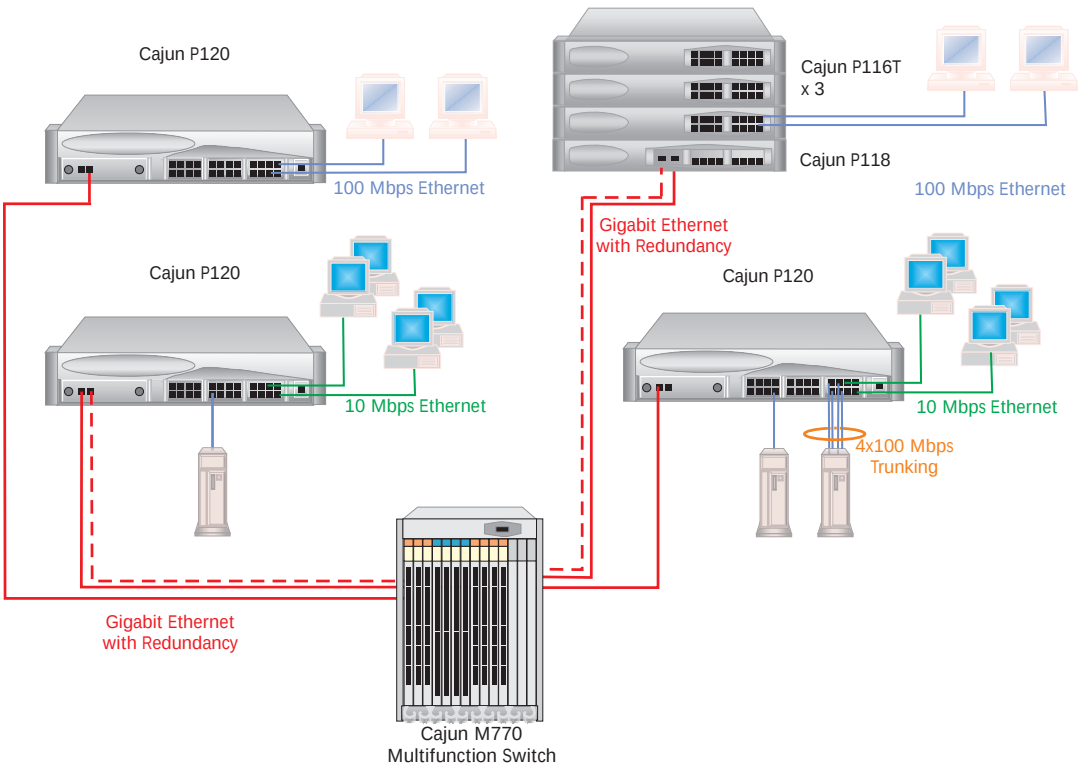
Figure 3.1 Cajun P120 and P110 at the edge with a Cajun P550 Backbone



Application 2

This application shows two Cajun P120 switches connected to another P120 switch and a P110 stack using a Cajun M770 Switch backbone. In this drawing, the Cajun X120S2 SX Expansion modules in the P120 switches provide a Gigabit Ethernet link with redundancy to the Cajun M770 Multifunction switch.

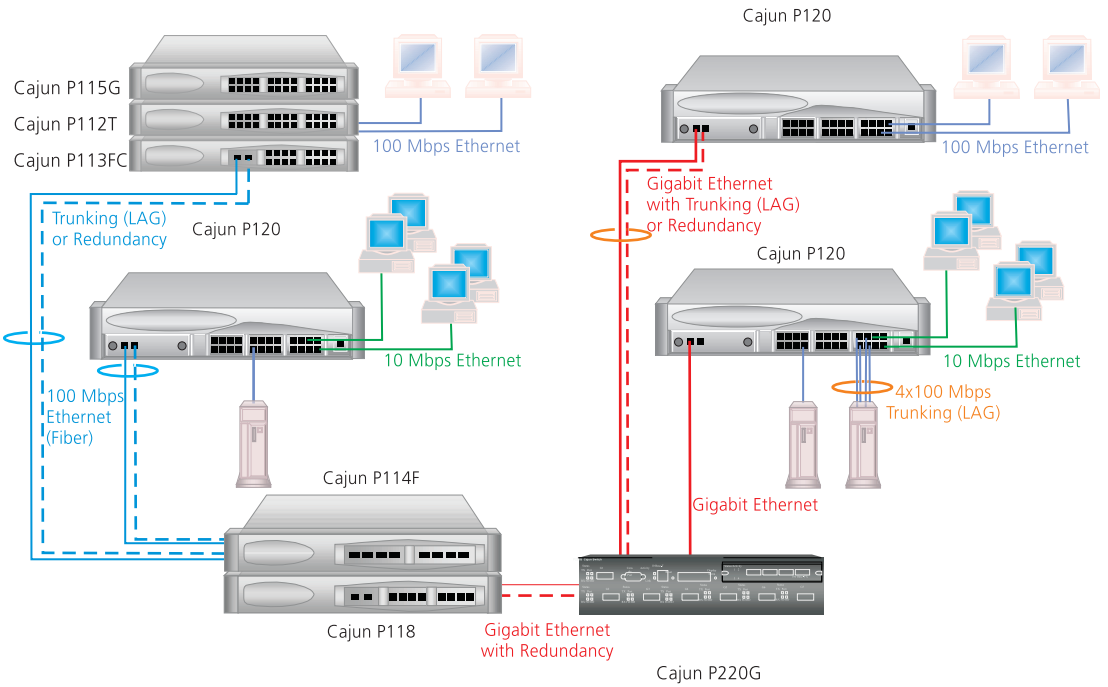
Figure 3.2 Cajun P120 and P110 at the Edge with a Cajun M770 Switch Backbone



Application 3

This application shows a P120 switch and a P110 stack on the floors of a building as part of a Small/Medium-sized Enterprise (SME) network. Cajun P220G and Cajun P110 form the backbone. On the left side of the drawing, the Cajun X120F2 100Mbit (with redundancy) Fiber Expansion module in the P120 switch connect to a Cajun P110 stack. On the right, the connection to the Cajun P220G is via Cajun X120S2 SX Gigabit Ethernet Expansion modules.

Figure 3.3 Cajun P120 and P110 on the floors of a Small/Medium size Enterprise (SME) network with a Cajun P220G and Cajun P110 Backbone.



Chapter 4

Installation and Setup

The Cajun P120 works out of the box, namely, after following the simple installation instructions, all the Cajun P120 ports provide complete connectivity. No configuration is required in order to make the system work.

Positioning

Cajun P120 can be mounted in a standard 19-inch equipment rack in a wiring closet or equipment room. Alternatively, it can be free standing. When deciding where to position the unit, ensure that:

- It is accessible and cables can be connected easily and according to the configuration rule.
- Cabling is away from sources of electrical noise such as radio transmitters, broadcast amplifiers, power lines and fluorescent lighting fixtures.
- Water or moisture cannot enter the unit's case.
- Air-flow around the unit and through the vents in the back and sides of the case is not restricted.

Note: Use cross cables to interconnect to other switches.

Rack Mounting

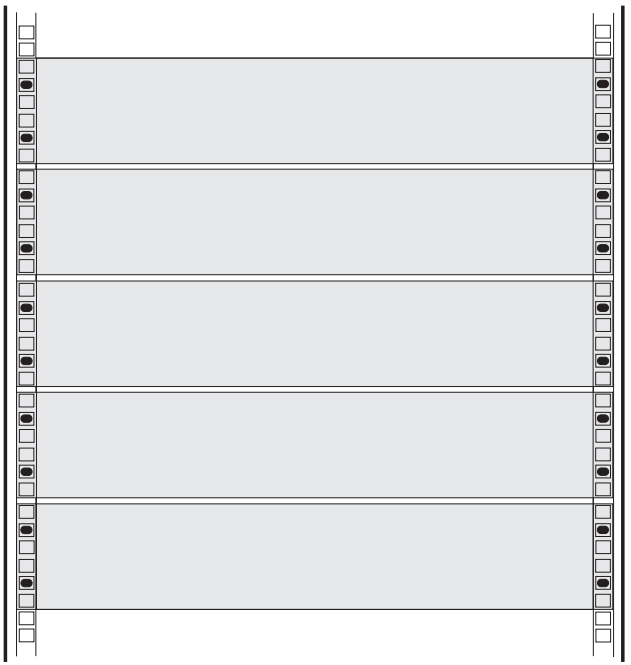
The Cajun P120 enclosure fits in most standard 19-inch racks. Cajun P120 is 2U (88 mm, 3.5") high.

Warning: Disconnect all cables from the unit before continuing.

Place the switches in the rack as follows:

1 Snap open the ends of the front panel to reveal the fixing holes.
2 Insert the unit into the rack. Ensure that the Cajun P120 screw holes are aligned with the rack hole positions as shown in Figure 4.1.

Figure 4.1 Cajun P120 Rack Mounting



3 Secure the unit in the rack using the screws. Use one screw on each side. Do not overtighten the screws.
4 Snap close the hinged ends of the front panel.
5 Ensure that the ventilation holes are not obstructed.

Powering On

To power on the unit, insert a power cord into the power inlet in the back of the unit.

After power up or reset, the Cajun P120 performs a self test procedure.

Installing Expansion Modules

Caution: The expansion modules contain components sensitive to electrostatic discharge. Do not touch the circuit board unless instructed to do so.

To install an expansion module:

1 Remove the blanking plate or other module (if installed).
2 Insert the module gently in the slot, ensuring that the board is aligned with the rails.
3 Press the module in firmly until the connector at the back of the module is completely inserted into the internal Cajun P120 connector.
4 Gently tighten the two screws on the front panel of the expansion module by turning the knobs.
5 We recommend that you reset the Cajun P120.

To remove an existing expansion module:

1 Loosen the two screws on the front panel of the expansion module by turning the knobs.
2 Grasp the two knobs one near each side of the front panel, and pull gently but firmly towards yourself.

Note: The Cajun P120 switch must not be operated with the expansion slot uncovered; the expansion module should be covered with the supplied blanking plate if necessary.

3 Insert another expansion module or the blanking plate.
4 We recommend that you reset the Cajun P120.

Configuring the Switch

The configuration of the Cajun P120 and its port settings may be performed from a text-based utility, from the stand-alone Cajun P120 Manager or from CajunView.

For instructions on the text-based utility, see the “Command Line Interface” chapter.

For instructions on the graphical user interfaces, refer to the “Cajun P120 Manager” Appendix and the Manager User’s Guide on the Management CD.

Cajun P120 Default Settings

The default settings for the Cajun P120 switch and its ports are determined by the Cajun P120 software and might change in newer versions of the Cajun P120 software. See the Release Notes for the most up-to-date default settings.

Switch Settings

Table 4.1 Default Switch Settings

Function	Default Setting
Cajun P120 IP Address	149.49.32.134
Bootp Mode	Never
Default Gateway	0.0.0.0
SLIP Address	192.168.10.1
Management PC SLIP Address	192.168.10.2
VLANs	VLAN 1
Spanning Tree	Enabled (Disabled in Version 1.0)
TFTP Mode	Limited
TFTP Server	0.0.0.0
TFTP File Name	p120.lst
Address Aging (CAM)	Enabled

Port Settings

Table 4.2 Default Port Settings

Function	Default Setting
Port Speed and Mode	• 10/100M copper ports: auto-negotiation • 100Base-FX ports: 100 full • 1000Base ports: 1000 full
Port Administration State	Enabled
Port VLAN Tagging	No Tagging
Flow Control	• 10/100 and 100 Mbps – Disabled • 1000 Mbps – Auto-negotiation
Port Mirroring	Disabled
Early Packet Drop (HOLB-P)	• 10/100T and 100F Mbps – Disabled • 1000 Mbps - Enabled
Link Aggregate Grouping (LAG or “Trunking”)	None
Redundant Link	None
Duplex Mode	• 10/100 Mbps ports: auto • Gigabit Ethernet ports: full • 100 Mbps fiber ports: full
Port Priority	Regular
Port Security	Not Secured

Functions operate in their default settings unless configured otherwise.

Cabling

Cajun P120 modules include the following types of ports (according to the speed and standard they support): 10Base-T, 100Base-TX, 100Base-FX, 10/100 Mbps auto-negotiating, 1000Base-SX and 1000Base-LX. To interconnect Cajun P120 switches with copper wire crossed cables are required.

- The maximum UTP cable length connected to a 10/100 Mbps port operating as 10Base-T, is 100 m (328 ft.).
- A UTP Category 5 cable may be connected to any 100Base-TX port, via an RJ-45 connector. The maximum UTP cable length connected to a 100Base-TX port, or a 10/100 Mbps port operating as 100Base-TX, is 100 m (328 ft.).
- A fiber-optic cable may be connected to any 100Base-FX port, via a pair of SC connectors. The maximum fiber cable length connected to a 100Base-FX port is 412 m (1,352 ft.) when operating in half duplex, and 2 km (6,562 ft.) when operating in full duplex.

Appropriate cables are available from your local supplier.

Table 4.3 Gigabit Ethernet Cabling

Gigabit Interface	Fiber Type	Diameter (µm)	Model Bandwidth	Maximum Distance (m)
1000BASE-SX	MM	62.5	160	220
1000BASE-SX	MM	62.5	200	275
1000BASE-SX	MM	50	400	500
1000BASE-SX	MM	50	500	550
1000BASE-LX	MM	62.5	500	550
1000BASE-LX	MM	50	500	550
1000BASE-LX	SM	9	NA	5,000

*1000BASE-LX over Multimode fiber requires a special Patch cord cable which you can obtain from your local cable supplier.

Connecting to the Serial Ports

The Cajun P120 has two serial ports – one on the front panel for connecting a PC or terminal, and one on the back panel of the unit for connecting a modem.

The RJ-45 port on the front panel of the Cajun P120, labeled Console, may be used for configuration of the switch using the built-in Command Line Interface (CLI, Terminal Emulation). The SLIP serial port, on the back panel of the Cajun P120, may be used for out-of-band SNMP management, Telnet or a TFTP server.

Their settings are as follows

- Baud Rate - 9600 bps
- Character Size - 8
- Parity - None
- Stop Bit - 1
- Flow Control - None

The terminal connected to the serial port must be configured with the same settings; this setting should work with any PC COM port over a DB-9 to RJ-45 connector.

Table 4.4 Pinout of the Serial Interface (RJ-45) and the Connection to SLIP Modem (D9)

RJ-45 PINS (front connector)	D9 PINS (back connector)
1 – NC	1 – CDB
2 – RXDA	2 – RXDB
3 – TXDA	3 – TXDB
4 – CDA	4 – DTRB/REQB
5 – GND	5 – GND
6 – DTRA/REQA	6 – NC
7 – RTSA	7 – RTSB
8 – CTSA	8 – CTSB
	9 – NC

* The above pinout reflects the functionality of the signals, as seen from the Cajun P120.

Chapter 5

Introduction to the Command Line Interfaces

This chapter describes how to begin configuring the Cajun P120 switch using the text-based Command Line Interface (CLI or Terminal Emulation). You can choose and switch between two CLI versions, the Cajun Campus CLI (Chapter 7) and the Legacy CLI (Chapter 6).

You can also configure your Cajun P120 using the Cajun P120 Manager with its graphical user interface (see Appendix C).

The CLI configuration procedure involves establishing a Telnet session or a serial connection and then using the Cajun P120's internal CLI. The CLI is command-line driven and does not have any menus. To activate a configuration option, you must type the desired command at the prompt and press Enter. The commands are arranged in a hierarchy such that a command contains a group of related functions.

Switching Between CLI Versions

There are two CLI versions, the Legacy CLI and the Cajun Campus CLI. By default, the Cajun P120 opens up with the Legacy CLI. To switch from the Legacy CLI to the Cajun Campus CLI type the command `native`. To return to the Legacy CLI type the command `legacy`.

Establishing a Serial Connection for Configuration

Perform the following steps to connect a VT-100 terminal or PC with VT-100 emulation (local connection) to the Cajun P120 switch Console port for configuration of switch parameters:

1. Use the serial cable supplied to attach the RJ-45 console connector to the Console port and the DB-9 connector to the serial (COM) port on your PC/ terminal.
2. Make sure that the serial port settings on the PC are 9600 baud, 8 bits, 1 stop bit, no parity and no local echo.
3. If you connected a PC, run a VT-100 emulation session (you can use the Windows® HyperTerminal).

Establishing a Telnet Session (Ethernet port or modem)

Follow these instructions to establish a Telnet session (remote connection) and then use the internal CLI to configure the switch.

1 Verify that the Cajun P120 and your PC are on the same local network. If the Cajun P120 is set with its default IP address, then change your PC's IP address so that it will be on the same IP subnet as the Cajun P120's default address. The port to which the PC is connected must be on the same VLAN as the agent.

Note:
i) If you establish a serial connection to the Cajun P120, you will not have to change your station's IP address.
ii) The Cajun P120 default IP address is 149.49.32.134 and subnet mask is 255.255.255.0.

2 Click `Start` ▶ **`Settings`** ▶ **`Control Panel`** ▶ **`Network`** from the Windows task bar.
3 Select **`TCP/IP`** from the list of installed network components.
4 Click **`Properties`**.
5 In the **`IP Address`** property sheet, enter the address **`149.49.32.134`** and net mask **`255.255.255.0`**.
6 Click **`OK`**.
7 Connect a shared port or switched port on the Cajun P120 switch front panel to your network.
8 Connect your PC to the network.
9 At the prompt, start the Telnet session by typing:
`telnet` *`<Cajun_P120_IP_address>`*
For example, **`telnet 149.49.32.134`**

Note: If there is a serial connection to the Cajun P120, the Telnet session will terminate the serial session.

10 Enter the default password **`norm`** in lower case letters (do NOT use uppercase). The `CajunP120>` prompt will display when you have established communications with the Cajun P120.
11 You can now configure the Cajun P120 and change its default IP address. See the Section "Navigation, Cursor Movement and Shortcuts" below.
12 If you changed your PC's IP address, you must return it to its original address.
13 Insert the Cajun P120 into your network and ping to verify that there are proper Ethernet communications.

Assigning Cajun P120's IP Address

Note: All Cajun P120 switches are shipped with the same default IP address. You must change the IP address of the Cajun P120 in order to guarantee that the switch has its own unique IP address in the network.

Changing the IP Address using the Command Line Interface (CLI, Terminal Emulation)

Via a Serial Connection or Telnet

You may use the CLI to assign the Cajun P120 an IP address and net mask. Once this address had been assigned and the switch inserted into the network, the CajunView station may establish communications with it.

1 Establish a serial connection or Telnet session as described in the "Command Line Interface" chapter.
2 At the > prompt, enter **`login`** to enter the Privileged level.
3 Enter the password. The default is `enable` (`lucent` in S/W Version 1.0)
4 At the `CajunP120-priv#` prompt, enter **`set ip`**.

Note: Alternatively you can use the simple-setup command to configure all the mandatory parameters. Refer to the "Command Line Interface" chapter for details.

5 Enter **`mng-port-ip <<x.x.x.x>> 255.255.255.0`** where you replace **`<<x.x.x.x>>`** with the IP address of Cajun P120 and replace the net mask if necessary. For example, `set mng-port-ip 194.3.2.16 255.255.255.0`
6 Press Ctrl+Q to exit the group.
7 Enter **`write`** and **`y`** to confirm. Wait 15 seconds for confirmation of the procedure.

Note: If there are any errors, the new configuration settings are not saved. You must correct these errors with the simple-setup or set command, and re-issue the write command.

8 Exit the Privileged mode, by typing **`exit`** at the prompt.
For example, `CajunP120-priv#` **`exit`**.
The prompt changes to `CajunP120>` to indicate that you are in Normal mode.
9 Exit the CLI session.
10 Insert the Cajun P120 into your network.

Configuring the Cajun P120's IP Address using Bootp

1 Configure your Bootp client server with: the Cajun P120's IP address and subnet mask (mng-port-ip), Default gateway address (def-gateway) and TFTP file name (tftp-filename).

Note:

a. Use the `revision` command from the CLI to list the Mng MAC address.
b. Set your Bootp server to always broadcast a reply to your MAC address.
c. The IP address of the Bootp server will be inserted as the TFTP server's IP address (tftp-server).
d. TFTP mode can be enabled and disabled in the Command Line Interface (IP group).

2 Connect the Cajun P120 to the network with the Bootp server.
3 Power on the Cajun P120 (with default settings). If it is successful, the parameters are configured and saved in the switch's flash memory. Each time that the switch is subsequently powered on it will use the parameters saved in flash memory.

Note: There is no indication of the success or failure of Bootp on the front panel. You can see the results in the CLI (not Telnet). Progress can be monitored from the station if you are using a SLIP connection.

If the Bootp is unsuccessful or there is no Bootp server connected (it takes approximately 1 minute for the Cajun P120 to respond), the Cajun P120 will start with the parameters saved in flash memory (either the default settings or last ones you saved).

Reasons that Bootp is unsuccessful include:

- Problems in communications between the client and server.
- Parameters set in the server are incorrect (therefore, it cannot save them).
- A router installed between the switch and the Bootp server is not configured to pass Bootp requests.

Navigation, Cursor Movement and Shortcuts

The CLI contains a simple text editor with these functions:

Table 5.1 Navigation, Cursor Movement and Shortcuts

Keyboard	Functions
Backspace	Deletes the previous character
Ctrl+U	Deletes the line
Ctrl+R	Refreshes the last command typed
Ctrl+Q	Breaks the current command
Up arrow/Down arrow	Scrolls back and forward through the command history buffer
Left arrow/Right arrow	Moves the cursor left or right
Tab	Completes the abbreviated command. You need to type a minimum of four characters.
Enter	Executes a single-line command

Getting Help

On-line help may be obtained at any time by typing **`help`** on the command line. To obtain help for the syntax/usage of a specific command, type the command followed by a space and **`help`**. In addition, in the Legacy CLI you can obtain a description of a specific command by typing the command followed by a space and a question mark **`(?)`**.

Command Syntax

Commands are not case-sensitive. That is, uppercase and lowercase characters may be interchanged freely.

To perform a command, you will need to specify the command followed by the Path.

For example: Console>show ip route (this shows routes in the routing table).

Conventions Used

The following conventions are used in this document to convey instructions and information:

- Commands are in boldface
- Variables that you supply are in pointed brackets <>
- Optional keywords are in square brackets [ ]
- Alternative but mandatory keywords are grouped in braces { } and separated by a vertical bar |
- Information displayed on screen is displayed in `text` font.

Chapter 6

Legacy CLI (Command Line Interface)

This chapter provides instructions for the configuration of your Cajun P120 using the text-based Legacy CLI (Command Line Interface or Terminal Emulation).

The configuration procedure involves either establishing a Telnet session or a serial connection and then using the Cajun P120's internal CLI (see Chapter 5, Introduction to the Command Line Interfaces). The CLI is command-line driven and does not have any menus. You type the desired command at the prompt and press Enter.

If you are configuring your Cajun P120 for the first time we suggest that you use the simple-setup command. This command provides you with a selection of all the relevant parameters that need to be configured initially.

Running the CLI

After running Telnet or connecting to the Console port, press Enter until the CLI begins and the `CajunP120>` prompt displays.

You are now in the Normal security level. Now you either need to use the simple-setup command as described below to easily configure the mandatory parameters, or enter the Privileged level. See the ”Entering the Privileged Level” section.

Factory default values, or the current defaults if the system was previously configured, are provided in square brackets after each parameter. You may use the default settings for any parameters that you desire. Although there are settings, such as IP addresses, that require you to enter a parameter value.

Note: Refer to the section “Command Syntax” on Page 38 for general information on the CLI user interface.

Easily Configuring the Mandatory Parameters

Using the Simple-Setup Command

The simple-setup command provides an easy way to configure the mandatory parameters on the Cajun P120.

To use the simple-setup command:

1 From the `CajunP120>` prompt, enter **`simple-setup`** on the command line: `CajunP120>` **`simple-setup`**.

2 Enter the password at the prompt to enter the Privileged level. The default password is `enable` (lower case, without quotation marks).
`>Enter password:` **`enable`**

The prompt changes to `setup>` to indicate that you are in the simple-setup command.

The group name, a short description of the group, the first parameter and its current value display are shown below:

Group: ip - Management IP parameter setup.

You are now going to configure the IP group. The first parameter is the Cajun P120 IP address. Its default setting is `149.49.32.134 255.255.255.0`.

`setup> mng-port-ip [149.49.32.134 255.255.255.0]?`

You may now set the Cajun P120’s IP address. Either:

- Keep the default setting by pressing Enter, or
- Type a new value and press Enter. For example, to change the IP address, enter: **`194.90.121.114 255.255.255.0`**

Note:
1) After entering a value, you cannot go back and change it at this time. You must either complete the setup command or break the setup command with Ctrl-Q. Then re-enter simple-setup or use the set command for a specific group/parameter.
2) If keyboard activity is not detected for 10 minutes, then you are automatically removed from the simple-setup command and Privileged level. Any changes you have made are lost. You can re-enter the simple-setup command.

The next parameter displays automatically.

setup> def-gateway [0.0.0.0]?

You may now set the Cajun P120's default gateway IP address. Either:

- Keep the default setting by pressing Enter, or
- Type a new value and press Enter. For example, to change the IP address, enter: **194.90.121.1**

The next parameter displays automatically.

setup> bootp-mode [never]?

You may now set the Cajun P120's Bootp mode. Either:

- Keep the default setting by pressing Enter, or
- Type a new mode and press Enter. The possible values are:
  - — once – Attempts to configure parameters from the Bootp client server when the Cajun P120 is powered on. Once Bootp is successful, then the setting is automatically changed to 'never'.
  - — always – Attempts to configure parameters from the Bootp server each time the Cajun P120 is powered on.
  - — never – Does not attempt Bootp.

For example, to stop the bootp process, enter: **never.**

Note: We recommend that you set the bootp-mode to never.

The next parameter displays automatically.

setup> slipip [192.168.10.1 255.255.255.0]?

You may now set the Cajun P120's SLIP address. Either:

- Keep the default setting by pressing Enter, or
- Type a new value and press Enter. For example, to change the IP address, enter: **194.90.120.2 255.255.255.0**

The next parameter displays automatically.

setup> slip-peer-ip [192.168.10.2]?

You may now set the SLIP address of the management station. Either:

- Keep the default setting by pressing Enter, or
- Type a new value and press Enter. For example, to change the IP address, enter: **194.90.120.115**

The next parameter displays automatically.

```
>Group: snmp - Configuration of SNMP community names and trap
managers.
setup> community 1 [community public r]?
```

Note: If you would like the SNMP traps to display in the OpenView Alarm Log, you should set the IP address and net mask of the OpenView station under trap manager (community 1 trap).

You are now going to configure the SNMP group. The first parameter is the SNMP community name. Its default setting is public read-only.

You may now set an SNMP community name. Either:

- Keep the default setting by pressing Enter, or
- Type a new value and press Enter. For example, to change the community name, enter: **newname r**

The `r` parameter defines the community as read only; the `rw` parameter defines it as read/write.

Continue with the other four community names until you come to the following prompt:

```
setup> community 1 trap [0.0.0.0]?
```

You may now set the IP address of a management station to receive traps. Either:

- Keep the default setting by pressing Enter, or
- Type a new value and press Enter. For example, to change the IP address, enter: **194.90.121.233**. (If you are running CajunView in conjunction with HP OpenView, you should enter the IP address of the OpenView station here for it to receive traps from the Cajun P120.)

Continue until you come to the following prompt:

```
Save the new configuration (y/n)?
```

Either:

- Enter **y** to save your configuration and write it to the flash memory.
- Enter **n** to discard this configuration.

If you wish to make any corrections or modifications, either exit the Privileged level and re-run the simple-setup command, or use the set command to set a particular group/parameter. (Be sure to use the write command to save your changes.)

Wait 15 seconds for confirmation of the write process.

Now exit the privileged level by entering **exit**.

```
CajunP120-priv# exit
```

The prompt changes to `CajunP120>` to indicate that you are in Normal level.

Verify that all the parameters were accurately saved by using the show all or show all list command.

Now exit your CLI session.

You have now completed the configuration of the Cajun P120 and it is ready for cabling and operation.

Security Levels

There are three security access levels – Normal, Privileged and Technician. A password is required to access the Privileged level and gain access to all the commands. The Technician level is reserved for Lucent technical support representatives.

Entering the Privileged Level

To enter the Privileged level, use the login command and enter the password. The default password is `enable`. However, it may be changed with the `setpw` command.

For example:

```
CajunP120> login
Enter password: enable
```

The prompt `CajunP120-priv#` displays indicating that you are in Privileged level.

Note:

1) You will be denied access to the Privileged level while an SNMP session is in progress. If you would like to break the SNMP session, use the `flogin` (forced login) command.
2) You may use the prompt command to change the text that prefixes the Privileged level (-priv#) and Normal level (#) prompt.

Exiting the Privileged Level

To exit the Privileged level and return to the Normal level enter the **`exit`** command.

Note:

1) If keyboard activity is not detected for 10 minutes, you are automatically removed from the Privileged level and returned to the Normal level. Any configuration changes you made are lost
2) While the Cajun P120 is in Privileged level, it cannot be configured by another manager, such as CajunView.

Changing the Privileged Level Password

Use the `setpw` Command to change the password for the Privileged Security Level (you can make this change from any level or prompt in the Legacy CLI):

The syntax for this command is: `setpw`

Example:

```
CajunP120> setpw
Enter old password: <old_password>
Enter new password: <new_password>
Retype new password: <new_password>
CajunP120>
```

Command Syntax

The CLI may display error messages if it encounters a problem. For details see the Section “Error Messages” on Page 66.

Command Abbreviations

All commands and parameters in the CLI can be truncated to an abbreviation of 4 characters or less, as long as the abbreviation is not ambiguous. For example, `revision` can be abbreviated `revi`.

For ambiguous commands, type the beginning letters on the command line and then use the Tab key to toggle through all the possible commands beginning with these letters.

Command Line Prompt

The default prompt for the Privileged level is `Cajun P120#`, however you may change Cajun P120 to the text of your choice using the prompt command.

However, once you enter a group of parameters, the prompt will indicate which group you are in (`group>`). For example, if you are in the IP group then the prompt appears as `ip>`.

While in a group, all commands that you enter will be performed on this group only. For example, `ip>` **`show`** will only display the current settings for the IP group.

If you have entered an index value for the group then it will also be indicated at the prompt. For example, `CajunP120-priv#` **`set P120`** will display the `P120>` prompt.

To exit a group and return to the `CajunP120>` or `CajunP120-priv#` prompt, press Ctrl-Q.

Saving and Exiting

After changing all the necessary parameters using the CLI, use the `write` command to save your system configuration. If you receive any error messages, your configuration has not been saved. You must correct the errors and re-issue the `write` command.

Notification of write errors is presented in a two column display:

- The left column contains the parameter values that you set in this session and need to be changed.
- The right column contains the parameter values currently saved in the Cajun P120.

Wait 15 seconds for confirmation of the write process. Then exit Privileged level by typing **`exit`** at the prompt. For example, `CajunP120-priv#` **`exit`**.

The cursor changes to `CajunP120>` to indicate that you are in Normal level.

Verify that all the parameters were accurately saved by using the **`show all`** or **`show all list`** command.

The Cajun P120 is now ready for cabling and operation. You may exit your CLI session.

Normal Level Commands

The following is a list of commands that can be used in the Command Line Interface (CLI).

Table 6.1 Normal Level Commands

Command Syntax	Function
flogin	Breaks the current SNMP session and forcibly enters the Privileged level.
getmib <object_ID>	Gets a MIB value.
getnextmib <object_ID>	Gets the next MIB value
help	Displays a list of the commands.
login	Enters the Privileged password level. (You cannot enter this level when an SNMP session is active. See also flogin.)
native	Changes CLI to native mode
partition	Enables/Disables partition on all HD ports

Table 6.1 Normal Level Commands (Continued)

Command Syntax	Function
Ping <IP_address> {#times}	Pings the IP address; default is four times *Use the Ctrl+Q command to stop the pinging.*
revision	Displays revision information for the various components.
rnds [on|off]	This is reserved for technical personnel only.
service	This is reserved for technical personnel only.
show <all|group> [list] <port#|index_value> Example: show ip	Displays the current configuration settings for a specific group or port. If you have made any changes using the CLI, they are listed in a column on the left (administration) and the current operational configuration is in a column on the right.
shLAG <group#|all>	Shows all ports that are assigned to a link aggregation group.
shport	Display a table of all ports.
simple-setup *This command is only available in Normal level.*	For the configuration of the initial parameters needed for the Cajun P120, including its IP address.
vlantab	Displays a table with VLAN assignments of ports.

Privileged Level Commands

You must enter the Privileged level, with the `login` or `flogin` command, before accessing these commands. These commands are available in addition to all the Normal level commands, except for the `simple-setup` command.

Table 6.2 Privileged Level Commands

Command Syntax	Function
cam-find	Lookup for specific MAC address in the soft-CAM
exit	Saves and exits the Privileged level (not the session) and returns to the Normal level
factory-def <group_name|all>	Reset parameter values to their factory defaults
genstat	Displays general traffic statistics for the Cajun P120
prompt <prompt_text>	Changes the CajunP120 prompt to the text that you specify. *The new prompt only takes effect after performing the write command.*
reload	Rereads the last saved configuration settings
reset	Resets the Cajun P120. This is equivalent to powering the switch off and on again.
rmonreset	Sets the Rmon MIB factory values.
set <group> <port#|index_value> [list] Example: set ip list	Set parameter values for a specific group
setmib <object_ID> <value>	Sets a MIB value
setpw	Changes the Privileged level password
sh-swt-stat <slot#> <port#> [r]	Displays received statistics for the port that you specified
stopr	Disables the repetitive command level (option [r])
tftp-cmd [start|stop|status] *If you use the tftp-cmd stop command, after resetting the Cajun P120, it will boot up from its INIT software.*	Starts, stops or displays the status of the TFTP process. *TFTP will not start if TFTP-OP is set to notftp in the TFTP group.*
write	Saves the current configuration in the Cajun P120's flash memory

Table 6.2 Privileged Level Commands (Continued)

Command Syntax	Function
copy {tftp | running-config} {running-config | tftp} <filename*> <server IP>	Allows you to upload or download a configuration file.
lock port {module number/ port_number | all}	Use this command to secure ports
unlock port {module number/ port_number | all}	Use this command to unlock ports and return them to not-secured mode
add mac {MAC_address port_number [vlan_number]}	Use this command to add an address to the secure list of a locked ports.
delete mac {MAC_address [port_number [vlan_number]]}	Use this command to delete an address from the secure table.

Sample Session

Contained below is a step-by-step configuration for the Cajun P120 unit. This sample configuration is based on a Cajun P120 with factory default settings.

Screen Display	Explanation
`CajunP120> login`	enters the Privileged security level
`Enter password: enable`	enter your password
`CajunP120-priv# set ip list`	set parameters for the IP group one by one
`CajunP120-priv# set snmp ip`	set parameters in the SNMP group one by one
`CajunP120-priv# set vlan list`	set relevant parameters in the Agent VLAN group
`CajunP120-priv# set p120 list`	displays the parameters that can be set on your Cajun P120
`CajunP120-priv# set tftp list`	set TFTP parameters one by one
`CajunP120-priv# write`	Saves the new configuration
`Save the new configuration (y/n) y`	confirmation
If you receive an error, correct it and reissue the write command.	
`CajunP120-priv# exit`	exits the Privileged level

Verify that all parameters were accurately saved by using the `show all` or `show all list` command. Exit your CLI session.

Subcommands

There are two optional subcommands that can be used with both the `show` and `set` commands. These subcommands: `[list], <index_value>` and `[r],` can be used either separately or combined.

List Subcommand [list]

When the `list` subcommand is used on the command line, each parameter and its set value in a group will be displayed one by one on the screen.

With the `show` command the system will wait for you to press Enter to display the next line.

With the `set` command, the system will wait for you to either press Enter to keep the current value for the parameter, or enter a new value for the parameter.

The next parameter in the group will display and it will wait for your action. It continues through every parameter in the group one-by-one.

Note: It is recommended to use the `list` subcommand until you are very familiar with the CLI parameters.

Use the `list` subcommand in this format:

```
<command> <group> list
```

The following example allows you to set parameters in the IP group one-by-one:

```
CajunP120-priv# set ip list
```

The following example will display all the current parameter settings one-by-one:

```
CajunP120-priv# show all list
```

Index_value Subcommand <Index_value>

When an index value is used on the command line, enter the desired port number to be configured.

To configure a specific port with several parameter values, enter commands in the format:

```
<command> <group> <index_value>
```

The following example allows you to configure parameters in the P120 group for port 4:

```
CajunP120-priv# set P120 4 list
```

The parameters display one-by-one.

Depending upon the command, you may sometimes use `all` for the index value.

Repetitive Command Mode [r]

When the repetitive mode command is used on the command line, the command is automatically repeated every few seconds. This is a good way to see what happens as you make system modifications.

The following example will repeatedly show the statistics for switched port #2:

```
CajunP120-priv# sh-swt-stat 2 r
```

To cancel the repetitive mode, enter **`stopr`** on the command line.

```
CajunP120-priv# stopr
```

Using the SHOW Command

The `show` command is used to display the current settings for a particular group of parameters. If you have never changed parameter settings, then these are the factory default values.

The following example will display the current settings for the IP group:

```
CajunP120> show ip
```

Listing the Groups You Can Set

If you enter **`set`** on the command line, a list of the groups that can be set with this command displays.

Note: This is useful for displaying the syntax for use in your configuration.

The available groups are:

```
CajunP120-priv# set
```

Group list:

`mibII-syst`	MIB-II system group params
`Cam`	Cam parameters
`ip`	Management IP parameters setup.
`IP-multi-cast`	IP-multicast parameters
`STA-GEN`	Parameters for configuring general spanning tree.
`STA-PORT`	Parameters for configuring spanning tree per port.
`P120`	Port configuration group
`vlan`	Vlan group
`copy-port`	Destination (network analyzer) and source ports setup
`tftp`	TFTP parameters setup.
`snmp`	Configuration of SNMP community names and trap managers

Note: One additional group is available when an Expansion module is installed. The group name depends on the type of Expansion module: X120F2, X120S2, X120S1, X120L2, X120L1 or X120T8.

Using the SET Command

The `set` command is used to change a particular parameter setting. Since all parameters are organized into groups, you must first enter the group and then configure the parameter.

For example, to set parameters in the IP group one-by-one with the list subcommand, enter:

```
CajunP120-priv# set ip list
ip> mng-port-ip [149.49.32.134 255.255.255.0]?
```

You must either:

- Press Enter to accept the parameter value displayed in square brackets, or
- Enter another IP address and net mask such as **`194.3.4.1 255.255.255.0`**

Note: The parameter displayed in square brackets in the parameter values changed during this session (administrative parameters).

After performing either of these options, the next parameter and its value display.

```
ip> def-gateway [0.0.0.0]?
```

Again you must either:

- Press Enter to accept the parameter value displayed in square brackets, or
- Enter another IP address and net mask, such as **`194.4.3.2 255.255.255.0`**

After performing either of these options, the next parameter and its value display. This continues until you have completed all the parameters in the group. You are then returned to the Privileged level prompt (`CajunP120-priv#`).

Using the SHPORT Command

The `shport` command provides the current settings of all the ports in the Cajun P120 and expansion module. Port numbering is sequential and will differ depending upon the type of expansion module.

For example, to view port settings for all the ports, type the following command:

```
CajunP120> shport
```

port#|	Admin|	Duplex|	Link|	Speed|	FC mode|	Redundant
1	ena	half	up	10 Mbps	dis	none
2	ena	half	up	10 Mbps	dis	none
3	ena	half	up	10 Mbps	dis	none
4	dis	half	down	10 Mbps	dis	none
5	ena	half	down	10 Mbps	dis	none
6	ena	half	up	10 Mbps	dis	none
7	ena	half	up	10 Mbps	ena	none
8	ena	half	up	10 Mbps	dis	none
...	...	...	...	...	...	...
32*	ena	auto	down	auto	dis	none

Note: The total number of ports displayed is 24 for the Cajun P120 plus those in the expansion module.

Using the VLANTAB Command

The `vlantab` command displays a table containing the port type, and VLAN# for the ports.

To display the port table type the following:

```
CajunP120> vlantab
```

port#|	Port Type|	Vlan#
1	no-Tagging	1
2	no-Tagging	1
3	no-Tagging	1
.	.	.
.	.	.
.	.	.

Table 6.3 VLANTAB Parameters

Parameter	Definition
port #	Number of port (1-40).
Port Type	Type of port. Options are dot1Qtagging or no tagging.
VLAN#	VLAN to which the port is assigned.

Using the SHLAG Command

The SHLAG command displays a table containing the ports that are associated with a link aggregation group or all link aggregation groups.

For example, to show the ports assigned to all link aggregation groups:

```
CajunP120> shlag all
```

1. LAG# 1, Members = 2

Port	Role	Link	Duplex	Speed	Stations
1	Base	Down	auto	auto	0
2	Link	Down	half	10MB	0

Table 6.4 SHLAG Parameters

Parameter	Definition
Port	Number of the ports.
Role	Base port or Link
Duplex	Duplex mode
Speed	Speed of the port (auto, 10MB or 100MB)
station #	Number of stations (MAC addresses) whose frames have passed through this port.

Note: You should set all ports of a LAG to the same Duplex, Speed, VLAN, VLAN Tagging and Administration settings.

Configuration Upload and Download Commands

Copy Command

The syntax of this command is: **copy** {tftp | running-config}{running-config | tftp} <filename*> <server IP>

tftp	Keyword that allows the user to copy to or from a TFTP server.
running-config	Specifies the currently running configuration.

*

i) The default name of the configuration file is P120.cfg.
ii) You must also include the full path where the file is located.

Examples:

To upload the configuration file:

```
CajunP120-priv# copy running-config tftp C:\p120.cfg
149.49.38.41
IP address of remote host [149.49.38.41]? y
Upload configuration to [C:\P120.cfg]? y
```

Output:

```
Loading configuration please wait.....
Configuration has been copied successfully. (12316 bytes).
CajunP120-priv#
```

Caution: Before you can upload a configuration file to the TFTP server you must first create an empty file on the server. This file must have the same name and path as the file that you want to upload. Otherwise you will get an 'access violation' error message.

To download the configuration file:

```
CajunP120-priv# copy tftp running-config C:\config1.cfg
149.49.38.41
IP address of remote host [149.49.38.41]? y
Download configuration from [C:\config1.cfg]? y
Configure using config1.cfg from 149.49.38.41 (y/n)? y
```

Output:

```
Loading configuration please wait.....
Finished network download. (10067 bytes).
CajunP120-priv#
```

Security Commands

Lock Port Command

Use this command to secure ports. The syntax of this command is: **lock port** {module number/port_number | **all**}.
all - a shortcut for securing all ports of the device.

Examples:

```
CajunP120-priv# lock port 1/1
Port 1 locked
CajunP120-priv#
CajunP120-priv# lock port all
All ports locked!
CajunP120-priv#
```

Unlock Port Command

Use this command to unlock ports and return them to not-secured mode. The syntax of this command is:
unlock port { module number/port_number | all }

all - a shortcut for unsecuring all ports of the device

Example:

```
CajunP120-priv# unlock port 1/10
Port 10 unlocked
CajunP120-priv#
```

Add MAC Command

Use this command to add an address to the secure list of a locked ports (see *Lock Port Command* on page 50). The minimal parameters are address and port. It is optional to specify the VLAN of the address. If the VLAN is not specified the default is port's VLAN.

The syntax of this command is:
add mac {MAC_address port_number [vlan_number]}

Examples:

```
CajunP120-priv# add mac 00-60-5c-86-5b-81 2 3
Address 00-60-5c-86-5b-81 was added to the secure list !
CajunP120-priv#
```

If you try to add a MAC address to a non-secured port (Port #1 in this case) you get the following error message:

```
CajunP120-priv# add mac 00-65-5b-86-5b-82 1 2
ERROR: Try to add secured MAC to non-secured port 1
```

Delete MAC Command

Use this command to delete an address from the secure table. The required parameter is the address and the VLAN number. If the port was not specified, the address shall be cleared from all ports.

The syntax of this command is:

Delete MAC {MAC_address [port_number [vlan_number]]}

Examples:

```
CajunP120-priv# delete mac 00-60-5c-86-5b-81 2 3
Address 00-60-5c-86-5b-81 was deleted from the secure list !
CajunP120-priv#
```

If you try to delete a MAC address from a non-secured port (Port #1 in this case) you get the following error message:

```
CajunP120-priv# delete mac 00-65-5b-86-5b-82 1 2
ERROR: Try to delete secured MAC to non-secured port 1
```

Groups, Parameters and Default Settings

This section provides all the CLI parameters and their default values. Not all groups, parameters and commands are available when the Cajun P120 boots up from its INIT software.

How Groups are Organized - Finding Parameters

All parameters are divided into groups of related parameters. Since parameters within a group are interrelated, you cannot change a single parameter within a group.

Table 6.5 Parameter Summary

Configuration Topic	Group Name	Used for Setting	See Page
MIB-II System	MIB-II SYST	MIB-II System	53
CAM Configuration	CAM	CAM software	53
IP Configuration	IP	IP and SLIP addresses	54
IP-Multicast System Group	IP-MULTICAST	IP-Multicast configuration	55
Spanning Tree	STA-GEN	General spanning tree parameters	57
	STA-PORT	Port spanning tree parameters	58
P120 Port Configuration	P120	Cajun P120 Base port settings	59
Expansion Module Configuration	X120xx	Cajun P120 Expansion module port settings	62
Agent VLAN Configuration	VLAN	Agent VLAN	63
Port Mirroring	COPY-PORT	Source and destination ports (mirroring)	63
TFTP Configuration	TFTP	TFTP parameters	64
SNMP Configuration	SNMP	SNMP communities and trap managers	65

MIB-II System Group (MIB-II SYST)

This group provides the MIB-II configuration according to the IETF standard MIB-II, System Group.

To view or change these parameters, type the command:

`set|show mibII-syst list`

The output is as follows:

```
mibII-syst>contact-system [UNKNOWN ]
mibII-syst>name-system [CajunP120 ]
mibII-syst>location-system [UNKNOWN ]
```

CAM Configuration Group (CAM)

This group includes parameters for the configuration of the CAM software. The table below displays the parameters, a description of the parameters, the default values, and the valid range of values.

The syntax for this command is: **`set|show cam list`**

Table 6.6 CAM Group Parameters

Parameter	Description	Default Value(s)	Valid Range for Values
AGINGMODE	Enables aging	dis	ena, dis
AGETIMEOUT	Time interval for CAM aging	63	1-63

AGINGMODE — Determines whether or not aging is enabled on the CAM. When enabled, the MAC addresses that have not been used recently are deleted. The CAMENA parameter must also be set to enable for the aging function to work.

AGETIMEOUT — The time interval for CAM aging. One (1) is the minimum timeout and 63 is the maximum. Each timeout unit is about 8 seconds.

IP Configuration Group (IP)

This group includes parameters for the configuration of IP addresses. The table below displays the parameter, a description of the parameters, the default values, and the valid range of values.

To view or change these parameters, type the command **`set|show ip list`** at the prompt.

Table 6.7 IP Group Parameters

Parameter	Description	Default Value(s)	Valid Range for Values
MNG-PORT-IP	Cajun P120 IP address and net mask	x.x.x.x 255.255.255.0	IP address format
DEF-GATEWAY	Default gateway IP address	0.0.0.0	IP address format
BOOTP-MODE	Bootp client server support	never	always, never, once
SLIPIP	Serial IP address and net mask	x.x.x.x 255.255.255.0	IP address format
SLIP-PEER-IP	Serial IP address of the management station	x.x.x.x	IP address format

MNG-PORT-IP Enter the IP address and net mask for the Cajun P120. This is required for CajunView network management.

DEF-GATEWAY Enter the IP address of the default gateway to access the network.

BOOTP-MODE — There are three settings for the Bootp-mode command:

- once – Attempts to configure parameters from the Bootp client server when the Cajun P120 is powered on. Once Bootp is successful, then the setting is automatically changed to 'never'.
- always – Attempts to configure parameters from the Bootp server each time that the Cajun P120 is powered on.
- never – Does not attempt Bootp

See also "Configuring Cajun P120 IP Address with Bootp" in the Installation and Setup chapter.

We recommend that you set the bootp-mode to "never" if you will not be using a Bootp server. If you change this setting, it will not take affect until the switch is reset or powered off and on.

SLIPIP — Enter the IP address and net mask for the SLIP connection. *The IP addresses for the Cajun P120 and management station must be on the same subnet.*

SLIP-PEER-IP — Enter the IP address for the management station with the SLIP connection.

IP-Multicast System Group (IP-MULTICAST)

This group provides the IP Multicast configuration according to IGMP standards. The table below displays the parameters, a description of the parameters, the default values, and the valid range of values.

To view or change these parameters, type the command:

`set|show IP-multicast list`

Table 6.8 IP-multicast Group Parameters

Parameter	Description	Default Value(s)	Valid Range for Values
IPMC-FILTERING	Enables/Disables IP-multicast mode	Disabled	Enabled/ Disabled
IPMC-HOST-AGING	Time after which a host who has stopped sending IGMP reports is removed from a Multicast Group	10 Minutes	30 Seconds to 30 Minutes
IPMC-ROUTER-AGING	Time after which the router port information is deleted when the router is inactive	30 Minutes	30 Seconds to 2 Hours

Table 6.8 IP-multicast Group Parameters (Continued)

Parameter	Description	Default Value(s)	Valid Range for Values
IPMC-DELAY	Delay before a newly learned entry is inserted into the hardware	10 Seconds	1 Second to 5 Minutes

IPMC-FILTERING	Allows you to enable/disable IP-multicasting.
IPMC-HOST-AGING	The time delay after which ports that no longer send IGMP reports are removed from a Multicast Group.
IPMC-ROUTER-AGING	The time delay after which the router port information is deleted if a router is found to be inactive.
IPMC-DELAY	When the Cajun P120 becomes aware of a Multicast Group on a certain VLAN there is a time delay before the Cajun P120 begins filtering traffic for that group.

Spanning Tree Group (STA-GEN)

This group includes parameters to enable the spanning tree algorithm (IEEE 802.1D and RFC 1493) and set its parameters. The table below displays the parameters, a description of the parameters, the default values, and the valid range of values.

The syntax for this command is:

`set|show sta-gen`

Table 6.9 STA-GEN Group Parameters

Parameter	Description	Default Value(s)	Valid Range for Values
STA-PRIO	Switch priority	8000	0000-FFFF
STA-MODE	Enables Spanning Tree	dis	ena, dis

STA-PRIO — Priority setting (hexadecimal value) used for determining the Root switch/bridge. The Bridge ID, based on the priority and the MAC address, is a unique value for each participant in the Spanning Tree algorithm.

STA-MODE — Enables or disables Spanning Tree for the Cajun P120 switch.

Spanning Tree Group (STA-PORT)

This group includes parameters for the configuration of the spanning tree parameters per Cajun P120 port. The table below displays the parameters, a description of the parameters, the default values, and the valid range of values.

The syntax for this command is:

`set|show sta-port`

If you do not enter a port#, all ports will be displayed.

Table 6.10 STA-PORT Group Parameters

Parameter	Description	Default Value(s)	Valid Range for Values
PORT-PRIO	Port priority	80 Hex	00-FF
PATH-COST	Port path cost	13 Hex (Port 25/26 4 Hex)	1-FFFF
TOP-CHG	Enables topology changes	ena	ena, dis

PORT-PRIO — This is the priority (hexadecimal value) of the port used in determining its state.

PATH-COST — This is the path cost of the port used in determining its state. Faster ports should be set with a lower path cost. We recommend a path cost of 4 for Gigabit ports, 19 (Decimal) for 100M ports, and 100 for 10M ports.

TOP-CHG — Determines whether changes in this link will or will not cause a topology change. Ports with end-stations connected to them should be set to disable (dis) to prevent changes in the state of the end-station (such as powering off the PC) from generating a topology change. Ports with all devices, other than end-stations, connected to them should be set to Enable (ena; default).

P120 Port Configuration Group (P120)

This group includes parameters for the configuration of switched ports. The table below shows the parameter names, default values, range of values, and value to be used with the index keyword.

The syntax for this command is:

`set|show P120 <all|port#> list`

Table 6.11 P120 Group Parameters

Parameter	Description	Default Value(s)	Valid Range for Values
ADMIN	Enables the port to forward frames	ena	dis, ena
DUPLEX	Duplex type and speed depending on the device to be connected	auto (if supported), full (for 1000M ports)	100-half, 100-full, 10-half, 10-full, auto
REDUNDANT	Creates up to 4 redundant pairs	none	1 primary, 1 backup 2 primary, 2 backup 3 primary, 3 backup 4 primary, 4 backup
LAG	Sets link aggregation	none	base, link, none
FLOW-CONTROL	Enables flow control	dis	ena, auto, dis
HOLB-P	Allows early packet drop	dis	ena, dis
PORT-PRI	Sets port priority	regular	regular, high
PORT-VLAN	Sets port VLAN	1	1-255
VLAN-MODE	Sets VLAN tagging	No tagging (no 802.1q tagging)	tagging, no tagging

ADMIN	Enable or disable the forwarding of frames by the port.
DUPLEX	Select the duplex mode of device that is connected to each switch port: • 100-half – use this to set the port to half duplex and 100 Mbps. • 100-full – use this to set the port to full duplex and 100 Mbps. • 10-half – use this to set the port to half duplex 10 Mbps. • 10-full – use this to set the port to full duplex and 10 Mbps. • auto – use this for a 10/100 Mbps port that is connected to a device that supports auto-negotiation.
REDUNDANT	Use this to configure redundant links. If one link should fail, the other link will automatically take over the load. You may create four separate redundant links per Cajun P120. One link should be configured as Primary and the other link should be configured as Backup. The link designated Primary is then the operational link and Backup is its redundant link. *Both the operational link and the redundant link should be assigned to the same VLAN. Redundancy should be configured on one side of the connection. Only 4 pairs of redundant links are permitted.* *Avoid using redundancy when Spanning Tree is enabled.*
LAG	Use this to configure Link Aggregation Groups - LAG (trunk). A link may consists of up to 8 ports. The available groups are: 1-4, 13-16 5-8, 17-20 9-12, 21-24. Each Cajun P120 supports up to 4 LAGs. • none – normal operation, no link aggregation. • base port (flood port) – sets this port to the primary port. This is the port that transfers broadcasts and multicasts as well as the one used for the active spanning tree algorithm. Each LAG must have one port set to base. • link – sets the port to participate in the link aggregation group. *The same port may not be set as both a link aggregation and a redundant link. For link aggregations to operate, the cables must be connected to match your settings (i.e. Primary-to-Primary and Secondary-to-Secondary). All members of a link aggregation group, should be assigned to the same VLAN.*

FLOW-CONTROL Use this to enable flow control on a full duplex port or enable the auto-negotiation process to determine whether the port and device connected can operate using flow control.
When you disable the flow control setting of 10 Mbps or 100 Mbps ports, the change will not take effect until the switch is reset or powered off and on again.

HOLB-P Use this to release traffic overload scenarios by early packet drop.

PORT-PRI Use this to change the priority settings for the port.
A Round Robin chain ensures that low priority frames will not be starved.

- regular– all frames received on this port will have a regular priority, unless the frame is tagged with high priority.
- high – forces all frames received on this port to have a high priority.

The Cajun P120 treats all the received BPDUs as high priority packets - regardless of the Port-Priority and to the Port Tagging Mode. Unknown frames are always set to low priority.

PORT-VLAN Use this to set ports to a VLAN or show which ports are on which VLAN.

VLAN-MODE Use this to set the port VLAN tagging mode. There are two available modes:

- Tagging - In this mode all packets are transmitted tagged with their VLAN and Priority in the 802.1Q format (in SW Ver. 1.0, packets belonging to the Port VLAN are transmitted untagged). The port is “BindToAll” VLANs within the Cajun P120 switch.
  Use this mode when connecting 802.1Q-compliant devices to such a port.
- No Tagging - In this mode all packets are transmitted untagged. The port is “bindTo” only the Port VLAN.
  Use this mode when connecting legacy or 802.1Q priority-tagged devices.

In both modes, received tagged packets are mapped to their VLAN in the tag, while untagged or priority-tagged (VIDEO) packets are mapped to the Port VLAN.

Note:
1. To create a true backbone link (Tx and Rx packets are VLAN tagged), set Port-VLAN of such a link to an unused VLAN number, and set its VLAN-tagging mode to "tagging".
2. To create a hybrid segment (on which both tagging and non-tagging devices are connected), set Port-VLAN of such a link to the VLAN number of the non-tagging devices, and set its VLAN-tagging mode to "tagging".
3. When connecting two switches, users should always set *the same* Port-VLAN number on both sides of the link - regardless of the VLAN Tagging mode.
4. In a P120 environment, VLAN #255 is not used as a Global-VLAN. This means that when connecting with Cajun P110, M770, or M440 environments, packets that belong to VLAN #255 may be forwarded differently in each environment. Do not use #255 in a mixed environment with switches that do support the VLAN Global concept.

Expansion Module Group (X120xx)

This group includes parameters for the configuration of the expansion modules. The table below displays the module name and its abbreviation.

The syntax for this command is:

`set|show X120`*`xx`*

Where ***xx*** is the module type (e.g., L2, T8...)

Table 6.12 Module Name Abbreviations

Module Name	Abbreviation
Cajun X120S2	X120S2
Cajun X120L2	X120L2
Cajun X120S1	X120S1
Cajun X120L1	X120L1
Cajun X120F2	X120F2
Cajun X120T8	X120T8
Cajun X120G2	X120G2

For a description of the Expansion Module Group Parameters see the Section "P120 Port Configuration Group (P120)" on Page 59 (see Note below.)

Note: Autoneg is not a valid value for 100 Mbps Fiber Expansion modules when setting Duplex Mode.

Agent VLAN Group (VLAN)

This group includes parameters for the configuration of the Agent VLAN. The table below displays the parameters, a description of the parameters, the default values, and the valid range of values.

To view or change these parameters, type the command:
`set|show vlan list`
at the prompt.

Table 6.13 VLAN Group Parameters

Parameter	Description	Default Value(s)	Valid Range for Values
MNGVLAN #	Defines the VLAN of the Cajun P120 agent	VLAN 1	1-3071 (1-255 in S/W Version 1.0)

Note: The Agent VLAN must be the same as the Management Station VLAN.

Port Mirroring Group (COPY-PORT)

This group includes parameters for the configuration of the destination port (the port to which you wish to connect the network analyzer) and source port (the port that you want to analyze/monitor). The table below displays the parameters, a description of the parameters, the default values, and the valid range of values.

The syntax for this command is:

`set|show copy-port`

Table 6.14 COPY-PORT Group Parameters

Parameter	Description	Default Value(s)	Valid Range for Values
DEST-PORT	Destination port	none	1-40, none
SOURCE-PORT	Source port	none	1-40, none

DEST-PORT Port to be connected to an external probe/network analyzer.

SOURCE-PORT The port that will be mirrored to the destination port.

Note: These limitations apply when configuring the destination and source ports:

* The same switched port cannot be configured to be both a source port and a destination port.
* Only a single destination port can be set at one time in the Cajun P120.
* If the destination port is 10 Mbps, you may loose packets.
* Source and destination ports should be in the same VLAN.

TFTP Configuration Group (TFTP)

This group includes TFTP configuration parameters. The table below displays the parameters, a description of the parameters, the default values, and the valid range of values.

To view or change these parameters, type the command **`set|show tftp list`** at the prompt.

Table 6.15 TFTP Group Parameters

Parameter	Description	Default Value(s)	Valid Range for Values
TFTP-OP	TFTP operation setting	limited	limited, tftp-forever, notftp
TFTP-IP	IP address of TFTP host	0.0.0.0	IP address format
TFTP-FILENAME	TFTP file name	P120.lst	54 characters max.

TFTP-OP	Select the TFTP operation setting: • limited – automatically attempts TFTP. If the attempt is unsuccessful, it makes 10 more attempts. This setting is recommended. • tftp-forever – automatically attempts TFTP. If the attempt is unsuccessful, it continues to try indefinitely. • notftp – does not perform TFTP. use the `tftp-cmd` command to start or stop the TFTP process.
TFTP-IP	Enter the IP address of the TFTP host. This is required for the TFTP process.
TFTP-FILENAME	Enter the path and name of the TFTP list file (text file with a list of files to be downloaded from the TFTP server). See Appendix B, Software Download.

SNMP Configuration Group (SNMP)

This group includes parameters for the configuration of SNMP communities and management stations to receive traps. The table below displays the Index values, the parameter names, the community name, and their privileges.

To view or change these parameters, type the command **`set|show snmp list`** at the prompt.

Table 6.16 SNMP Group Parameters

Index Value	Parameter	Community Name 16 characters max.	Privileged	
			read and write (rw)	read only (r)
Community 1	COMMUNITY	public		r
Community 2	COMMUNITY	pl	rw	
Community 3	COMMUNITY	null		r
Community 4	COMMUNITY	null		r
Community 5	COMMUNITY	null		r

Index Value	Parameter	IP Address of IP Management Stations
Community 1	TRAP	_____.____.____.____
Community 2	TRAP	_____.____.____.____
Community 3	TRAP	_____.____.____.____
Community 4	TRAP	_____.____.____.____
Community 5	TRAP	_____.____.____.____

COMMUNITY — Allows you to change the list of community names and Privileges. Up to 5 community names can be defined for the Cajun P120.

TRAP — Enter the IP address of each management station that you would like to receive SNMP traps from the Cajun P120. Up to 5 trap managers can be defined.
If you would like the SNMP traps to display in the OpenView Alarm Log, you should set the IP address and net mask of the OpenView station under trap manager (community 1 trap).

Things to Keep in Mind

When you use the CLI and perform the write command, the CLI checks for inconsistencies in your configuration. If inconsistencies are found, it displays two columns of values – those already stored in the Cajun P120 and those that you have just configured and it cannot save. **Your configuration cannot be saved until you correct these inconsistencies and re-issue the write command.**

- You should change the Cajun P120's default IP address and net mask.

Error Messages

You may receive the following error messages when using the CLI.

- **`The Privileged level timer has expired. You have been removed from the Privileged level.`**
  After 10 minutes without keyboard activity, you are automatically removed from the Privileged level and returned to the non Privileged level. To re-enter the Privileged level use the login or flogin command and enter the password.
- **`This parameter is invalid. It is not found in the enumeration list.`**
  The value you entered is not found in the list of valid values for this parameter. Check the list of valid values and check your spelling.
- **`The number is out of range.`**
  The value you entered is not within the valid range for this parameter.
- **`This command can only be executed in the Privileged level. Enter Privileged level with LOGIN.`**
  You must be in Privileged level to use the command you entered. To enter Privileged level use the login command and enter the password.
- **`This command cannot be executed in the Privileged level. Exit Privileged level with EXIT.`**
  You must be in Privileged level to use the command you entered. To enter Privileged level use the `exit` command.
- **`This command cannot be nested.`**
  You have attempted to perform a new command before completing the previous command. You are still in a command when the prompt appears as `group>`. To break the previous command press Ctrl-Q.
- **`Bad configuration setup. The parameters are restored to their previous values.`**
  Your configuration could not be saved due to incorrect parameter settings. Your previous configuration has been restored.
- **`Field is missing.`**
  Most likely there are two values for this parameter, for example an IP address and net mask, and you have only entered one. You must enter both values even if you are only changing one value.

Chapter 7

Cajun Campus CLI (Command Line Interface)

This chapter provides instructions for the configuration of the Cajun P120 switch using the text-based Cajun Campus CLI (Command Line Interface or Terminal Emulation).

The configuration procedure involves establishing a Telnet session or a serial connection and then using the Cajun P120's internal CLI (see Chapter 5, Introduction to the Command Line Interfaces). The CLI is command-line driven and does not have any menus. To activate a configuration option, you must type the desired command at the prompt and press Enter.

Commands

Table 7.1 shows the commands for Normal level commands. Normal level commands are also available from the Privileged and Technical levels.

How Commands are Organized

Command descriptions are organized by groups. A full description of the command is found on the page shown in Table 7.1 and Table 7.2.

Table 7.1 User Level Commands

Commands	See page
Console> set enablepass	72
Console> set password	72
Console> set techpass	73
Console> set defpass	73
Console> enable	74
Console> show ip route	74
Console> show system	74
Console> show image version	75
Console> show snmp	75
Console> show interface interface	76
Console> show port	76
Console> show module	78
Console> show port flowcontrol	79
Console> show cam	80
Console> show cam mac	80
Console> show port mirror	81
Console> show download status	81
Console> copy	83

Table 7.2 Privileged Level and Security Commands (this level includes all the show commands from the previous level)

Command	See page
Console>(enable) lock port	82
Console>(enable) unlock port	82
Console>(enable) add mac	82
Console>(enable) delete mac	83
Console>(enable) disable	84
Console>(enable) download	84
Console>(enable) set logout	86
Console>(enable) set port mirror	86
Console>(enable) set port flowcontrol	87
Console>(enable) set ip route	87
Console>(enable) set license	88
Console>(enable) set snmp community	88
Console>(enable) set snmp trap	89
Console>(enable) set system location	89
Console>(enable) set system name	89
Console>(enable) set system contact	89
Console>(enable) set interface	90
Console>(enable) set port level	90
Console>(enable) set port negotiation	91
Console>(enable) set port enable	92
Console>(enable) set port disable	92
Console>(enable) set port speed	92
Console>(enable) set port duplex	93

Table 7.2 Privileged Level and Security Commands (this level includes all the show commands from the previous level)

Command	See page
`Console>(enable) set vlan`	95
`Console>(enable) clear port mirror`	96
`Console>(enable) clear ip route`	96
`Console>(enable) clear snmp trap`	97
`Console>(enable) clear vlan`	97
`Console>(enable) clear cam`	98
`Console>(enable) reset`	99
`Console>(enable) reset system`	99
`Console>(enable) show license`	99

Sample Session

Contained below is a step-by-step configuration for the Cajun P120 unit. This sample configuration is based on a Cajun P120 with factory default settings.

Screen Display	Explanation
`password: norm`	enter Normal level password
`Console> enable`	enter Login Name for Privileged level
`Enter password: enable`	enter Privileged level password
`console>(enable) set ip route`	set IP parameters
`console>(enable) set interface...`	set interface parameters
`console>(enable) set snmp community`	set snmp community
`console>(enable) set port...`	parameters that can be set on your Cajun P120
`console>(enable) disable`	exits the Privileged level

Verify that all parameters were accurately saved using the **show** command. Exit your CLI session.

User Level Commands

Password Commands

Set Password Command

Use the `set password` command to change the login password on the CLI. The command prompts you to enter the old password. If the password is valid, you are prompted to enter a new password and to verify the new password.

The syntax for this command is: **`set password`**

Example:

```
Console>(enable) set password
Enter old password: <old_password>
Enter new password: <new_password>
Retype new password: <new_password>
Console>(enable)
```

Set Enablepass Command

Use the `set enablepass` command to change the password for the Privileged level of the CLI. The command prompts you to enter the old password. If the password is valid, you are prompted to enter a new password and to verify the new password.

The syntax for this command is: **`set enablepass`**

Example:

```
Console>(enable) set enablepass
Enter old password: <old_password>
Enter new password: <new_password>
Retype new password: <new_password>
Console>(enable)
```

Note: You can change the User, Privileged or Technician Level passwords from any level.

Set Techpass Command

Use the `set techpass` command to change the password for the Technician level of the CLI. The command prompts you to enter the old password. If the password is valid, you are prompted to enter a new password and to verify the new password.

Note: Although you can change this password, the commands for the Technician level are intended for use by a qualified Lucent Technician only.

The syntax for this command is: **`set techpass`**

Example:

```
Console>(enable) set techpass
Enter old password: <old_password>
Enter new password: <new_password>
Retype new password: <new_password>
Console>(enable)
```

Set Defpass Command

Use the `set defpass` command to change all passwords back to their default settings.

Note: To use the `set defpass` command your Terminal must be physically connected to the Cajun P120's Console Port.

The syntax for this command is: **`set defpass`**

Example:

```
Console>(enable) set defpass
Password were set to their default values!
Console>(enable)
```

Enable Command

Enable Command

The `enable` command is used to enter the Privileged level. In Privileged level, additional commands are available. The (enable) in the prompt indicates that the system is in Privileged level and either Normal level or Privileged level commands can be entered.

The syntax for this command is: **`enable`**

Example:

```
Console> enable
Enter password:
Console>(enable)
```

Show Commands

Show IP Route Command

Use the `show ip route` command to display IP routing table entries.

The syntax for this command is: **`show ip route`**

Example:

```
Console> show ip route

 Destination   Gateway         Interface
 ------------  -------------   ------------
 0.0.0.0       172.20.22.201   ib1

Console>
```

Show System Command

The `show system` command provides the following system information:

```
console> show system
System-Up-Time         : 0 Day(s), 1 Hour(s), 44 Minute(s), 39 Second(s)
MIB-II System-Name     : CajunP120
MIB-II System-Contact  : John-Smith
MIB-II System-Location : Atidim
console>
```

Show Image Version Command

Use the `show image version` command to display the software version of the image on both Banks of the Cajun P120.

The syntax for this command is: **`show image version`** `[slot_num]`

`slot_num`	Module number (always 1)

Example:

```
Console> show image version
```

Mod	Module-Type	Bank	Version
1	CajunP120 Base	A	2.5.7
		B	2.0.8

Show SNMP Command

Use the `show snmp` command to display SNMP information.

The syntax for this command is: **`show snmp`**

Example:

```
Console> show snmp
 Community-Access      Community-String
 ----------------      ----------------
 read-only             public
 read-write            private
 trap                  public

 Trap-Rec-Address      Traps Enabled
 ----------------      -----------------
 192.122.173.42        all
 0.0.0.0               all
 192.122.178.44        all
Console>
```

Show Interface Command

Use the `show interface` command to display information on network interfaces.

The syntax for this command is: **`show interface`**

Example:

To display the sl0, sb1 and sb2:

```
Console> show interface
ib1: vlan 1 172.16.25.130 netmask 255.255.0.0
sl0: slip 0.0.0.0 dest 0.0.0.0
Console>
```

Show interface Command Output Fields:

`sl0`	Information on the SLIP interface
`slip`	IP address of the SLIP interface
`slip dest`	IP address of the host to which the console port will be connected
`ib1`	Information on the Agent interface
`vlan`	Number of the VLAN to which the ib1 interface has been assigned (known as the management VLAN)
`inet`	IP address of the interface
`netmask`	Network mask for the interface

Show Port Command

Use the `show port` command to display port status.

The syntax for this command is: **`show port`** `[slot_num[/port_num]]`

`slot_num`	Module number (always 1).
`port_num`	(Optional) Number of the port. If you do not specify a number, all the Cajun P120 ports are shown.

Example:

To display the status for port 4 on Cajun P120 (1):

```
Console> show port 1/4

      Admin      Link
Port  Status     State   Vlan   Level    Neg     Duplex  Speed   Type
----  -------    -----   ----   -----    ----    ------  -----   -----
1/4   disable    down    203    normal   enable  fdx     100     10_100
                                                                 BaseT

Console>
```

Port Table: show port Command Output Fields

Field	Description
Port	Cajun P120 (always 1) and port number
Admin Status	Administration status of the port (enable, disabled
Link State	Status of the port (up, down)
Vlan	Port-VLAN of the port
Level	Priority level for the port (normal or high)
Neg	The negotiation status of the port (enable, disable)
Duplex	Duplex setting for the port (fdx, hdx)
Speed	Speed setting for the port (10, 100).
Type	Port type, for example, 10_100BaseT, 10BaseFL, 100BaseTX, 100BaseFX MM, 100BaseFX SM, 10/100BaseTX.

Show Module Command

Use the `show module` command to display the Cajun P120 status and information. If an expansion sub-module is installed it's type and status are also shown.

The syntax for this command is: **`show module`** `[slot_num]`

`slot_num` Module number (always 1)

Example:

```
Console> show module

Mod   Module-Type      Ports   Serial-Num  C/S    Hw    SwVersion
---   -----------      -----   ----------  ----   ----  ----------
1     CajunP120 Base   24                  4.0          Bank A: 1.0
                                                        Bank B: 1.0

Mod   Expansion-Type   Ports   Serial-Num  C/S    Hw    SwVersion
---   --------------   -----   ----------  ----   ----  ----------
1     CajunX120S2      2
```

Output Fields

Field	Description
`Mod`	Module number (always 1)
`Module-Type`	Module type: Cajun P120 Base module or Expansion sub-module
`Expansion-Type`	Expansion board Type
`Ports`	Number of ports
`Serial-Num`	Serial number
`C/S`	Configuration Symbol
`Hw`	Hardware version
`Sw Version`	Current Software version running on the Cajun P120

Show Port Flowcontrol Command

Use the `show port flowcontrol` command to display per-port status information related to flow control.

The syntax for this command is:

`show port flowcontrol` `[slot_num[/port_num]`

`slot_num`	Module number (always 1)
`port_num`	(Optional) Number of the port on the module. If you do not specify a number, filters configured on all the Cajun P120 ports are shown.

Example:

This example shows how to display the flow-control port status and statistics:

```
Console> show port flowcontrol
Port   Send-Flow Control       Receive-Flow Control
       Admin        Oper       Admin       Oper
-----  ----------   ------     --------    --------
1/1    on           on         on          on
1/2    off          off        off         off
```

Output Fields

Field	Description
`Port`	Module and port number.
`Send-Flow Control- Admin and Send-Flow Control- Oper`	Flow-control administration. Possible settings: • ON indicates the local port sends flow control to the far end; • OFF indicates the local port does not send flow control to the far end;
`Receive-Flow Control- Admin and Receive-Flow Control- Oper`	Flow-control administration. Possible settings: • ON indicates the local port requires the far end to send flow control; • OFF indicates the local port does not allow the far end to send flow control;

Show Cam Command

Use the `show cam` command to display the CAM table or a specific MAC.

The syntax for this command is:

`show cam` `slot_num | port_num`

`show cam mac` `mac_addr [vlan]`

`vlan`	(Optional) Number of the VLAN. If a VLAN is not specified, all VLANs are displayed.
`slot_num`	Module number (always 1)
`port_num`	Number of the port.
`mac_addr`	MAC address.

Example:

To display dynamic CAM entries for all VLANs:

```
Console> show cam

 VLAN       DestMAC/Route Des     Destination Ports
 ----       -----------------     -----------------
 1          00-60-5c-86-5b-81     1/1
 1          00-60-2f-35-48-17     1/1
 1          00-80-24-f3-47-20     1/2
 1          00-60-09-78-96-fb     1/1
 1          00-80-24-1d-d9-ed     1/2
 1          00-80-24-1d-da-01     1/2
 1          08-00-20-7a-63-01     1/1

Total Matching CAM Entries Displayed = 7
Console>
```

This example shows routers listed as the CAM entries. When the MAC address belongs to a router, it is shown by appending an "R" to the MAC address. When a VLAN is specified, only those CAM entries matching the VLAN number are displayed.

```
Console> show cam mac 00-00-81-01-23-45

 VLAN       Dest MAC/Route        Destination Ports
 ----       --------------        -----------------
 1          00-00-81-01-23-45     1/9

Total Matching CAM Entries = 1
Console>
```

Show Port Mirror Command

Use the `show port mirror` command to display mirroring info. The syntax of this command is: **`show port mirror`** `[module_num[/port_num]]`

`mod_num`	(Oprional) number of the module.
`port_num`	(Optional) number of the source or the destination port.

Example:

```
Console>(enable) show port mirror 4/1.
```

Mirroring both Rx and Tx packets from port 1/1 to port 1/12 is enabled.

```
Console>(enable)
```

Show Download Status Command

Use the `show download` command to display the status of the download process. One session of download is active on the system.

The syntax for this command is: **`show download status`** `[slot_num]`

`slot_num`	Module number (always 1)

Example:

```
Console>(enable) show download status
  TFTP is looking for server.
  Download Host IP Address is 149.49.39.110
  TFTP Destination Bank is B
  Transferred file name - c:\p120\lucent_ver\1_1_2\p120.exe
  Received bytes: 0
  Request retry counter: 2
  Block retry counter: 0
```

Privileged Level Commands

Security Commands

Lock Port Command

Use this command to secure ports. The syntax of this command is: **lock port** {module number/port_number | **all**}. all - a shortcut for securing all ports of the device.

Examples:

```
Console>(enable) lock port 1/1
Port 1 locked
Console>(enable)
Console>(enable) lock port all
All ports locked!
Console>(enable)
```

Unlock Port Command

Use this command to unlock ports and return them to not-secured mode. The syntax of this command is:

unlock port { module number/port_number | all }

all - a shortcut for unsecuring all ports of the device

Example:

```
Console>(enable) unlock port 1/10
Port 10 unlocked
Console>(enable)
```

Add MAC Command

Use this command to add an address to the secure list of a locked ports (see *Lock Port Command* on page 82). The minimal parameters are address and port. It is optional to specify the VLAN of the address. If the VLAN is not specified the default is port's VLAN.

The syntax of this command is:

add mac {MAC_address port_number [vlan_number]}

Examples:

```
Console>(enable) add mac 00-60-5c-86-5b-81 2 3
Address 00-60-5c-86-5b-81 was added to the secure list !
Console>(enable)
```

If you try to add a MAC address to a non-secured port (Port #1 in this case) you get the following error message:

```
Console>(enable) add mac 00-65-5b-86-5b-82 1 2
ERROR: Try to add secured MAC to non-secured port 1
```

Delete MAC Command

Use this command to delete an address from the secure table. The required parameter is the address and the VLAN number. If the port was not specified, the address shall be cleared from all ports.

The syntax of this command is:

```
Delete MAC {MAC_address [port_number [vlan_number]]}
```

Examples:

```
Console>(enable) delete mac 00-60-5c-86-5b-81 2 3
Address 00-60-5c-86-5b-81 was deleted from the secure list !
Console>(enable)
```

If you try to delete a MAC address from a non-secured port (Port #1 in this case) you get the following error message:

```
Console>(enable) delete mac 00-65-5b-86-5b-82 1 2
ERROR: Try to delete secured MAC to non-secured port 1
```

Configuration Upload and Download Commands

Copy Command

The syntax of this command is: **copy** {tftp | running-config}{running-config | tftp} <filename*> <server IP>

tftp	Keyword that allows the user to copy to or from a TFTP server.
running-config	Specifies the currently running configuration.

*

i) The default name of the configuration file is P120.cfg.
ii) You must also include the full path where the file is located.

Caution: Before you can upload a configuration file to the TFTP server you must first create an empty file on the server. This file must have the same name and path as the file that you want to upload. Otherwise you will get an 'access violation' error message.

Examples:

To upload the configuration file:

```
Console>(enable) copy running-config tftp C:\P120.cfg
149.49.38.41
IP address of remote host [149.49.38.41]? y
Upload configuration to [C:\P120.cfg]? y
```

Output:

```
Loading configuration please wait…….
Configuration has been copied successfully. (12316 bytes).
Console>(enable)
```

To download the configuration file:

```
Console>(enable) copy tftp running-config config1.cfg
149.49.38.41
IP address of remote host [149.49.38.41]? y
Download configuration from [config1.cfg]? y
Configure using config1.cfg from 149.49.38.41 (y/n)? y
```

Output:

```
Loading configuration please wait…….
Finished network download. (10067 bytes).
Console>(enable)
```

Returning to Normal Mode

Disable Command

Use the `disable` command to return to normal mode from privileged mode.

The syntax for this command is: **`disable`**

Example:

```
Console>(enable) disable
Console>
```

Downloading a Software Image

Download Command

Use the `download` command to copy a software image from a specified host to the Flash memory of the Cajun P120.

The syntax for this command is:
download <host_IP><file_full_name><mod_num>

host	IP address of host
file	Name of file to be downloaded
slot_num	Module number (always 1)

Set Commands

Set Logout Command

The `set logout` command is used to set the number of minutes until the system automatically disconnects an idle session.

The syntax for this command is: **`set logout`** `<timeout>`

`<timeout>`	Number of minutes (0 to 10,000) until the system automatically disconnects an idle session. Setting the value to 0 disables the automatic disconnection of idle sessions Default = 20

Examples:

To set the number of minutes until the system disconnects an idle session automatically:

```
Console>(enable) set timeout 20
Sessions will be automatically logged out after 20 minutes of
idle time.
Console>(enable)
```

To disable the automatic disconnection of idle sessions:

```
Console>(enable) set timeout 0
Sessions will not be automatically logged out.
Console>(enable)
```

Set Port Mirror Command

Use the `set port mirror` command to define a port mirroring source-destination pair in the module. the syntax for this command is:
`set port mirror source-port` `mod_num/port_num` **`mirror-port`** `mod_num/port_num` **`sampling {always | disable } [direction both]`**

`mod_num`	Number of the source or destination module.
`port_num`	Number of the source or destination port.
`always`	keyword to activate this copy port entry.
`disable`	keyword to pass this copy port entry to the "not ready" state.
`both`	keyword to copy both incoming and outgoing traffic.

Example:

To mirror all traffic from port 4 into port 5:

`Console>(enable)` set port mirror source-port 4 mirror-port 5 sampling always direction both

Mirroring both Rx and Tx packets from port 4 to port 5 is enabled.

`Console>(enable)`

Set Port Flow Control Command

Setting of flow control advertisement capabilities for Giga ports (only):

- When giga auto-negotiation is enabled (via "set port negotiation … enable" command, or via snmp), the "set port flowcontrol …" command decides on the pause capabilities only.
- When giga auto-negotiation is disabled (via "set port negotiaton … disable command, or via snmp), the "set port flowcontrol …" command decides on the flow control mode itself.

The `show port flowcontrol` command displays "admin" and "oper" statuses for both the receiving and the sending of FC frames (a total of 4 statuses). "Admin" will refer to the pause capabilities, while "oper" will report the flow control mode decided together with the other side. Here, when "admin / rcv" is on and "admin / snd" is off, it refers to the pause capability state "symAndAsymRxFlowcontrol".

Set IP Route Command

Use the `set ip route` command to add IP addresses to the IP routing table. You can configure one default gateway with up to ten (10) default gateways for P120 family.

The syntax for this command is: **`set ip route`** `<0.0.0.0> <gateway IP>`

`gateway IP` IP address of the default gateway to access the network

Example:

This example shows how to add a default route to the IP routing table:

`Console>(enable)` **`set ip route 0.0.0.0 192.122.173.42`**

`Console>(enable)`

Set License Command

Use the `set license` command to install an application Software License.

The syntax for this command is: **`set license`**

Example:

```
Console> set license XXXX XXXX XXXX XXXX XXXX XXXX

 Application                License Key
 ------------   -----------------------------------
     SMON           XXXX XXXX XXXX XXXX XXXX XXXX
```

Set SNMP Community Command

Use the `set snmp community` command to set SNMP communities and associated access types.

There are two configurable SNMP communities, one for each access type.

The syntax for this command is:

`set snmp community` `<read-only|read-write> [community_string]`

`read-only|trap`	Assign read-only and trap access to the specified SNMP community.
`read-write`	Assign read-write access to the specified SNMP community.
`community_string`	(Optional) Name of the SNMP community.

The default configuration has the following communities and access types defined:

public---read-only

public---read-write

Example:

To set read-write access to the SNMP community called apple:

```
Console>(enable) set snmp community read-write apple
SNMP read-write community string set.
Console>(enable)
```

Set SNMP Trap Command

Use the `set snmp trap` command to enable or disable the different SNMP traps on the system or to add an entry into the SNMP authentication trap receiver table.

The syntax for this command is:

`set snmp trap` `rcvr_addr`

`rcvr_addr`	IP address or IP alias of the system to receive SNMP traps

Examples:

To enable SNMP traps to be sent to a specific manager:

```
Console>(enable) set snmp trap 192.122.173.42
SNMP trap receiver added.
Console>(enable)
```

Set System Location Command

Use the `set system location` command to set the mib2 system location MIB variable.

The syntax for this command is:

`set system location` `[string]`

`string`	Location string.

Set System Name Command

Use the `set system name` command to set the mib2 system name MIB variable.

The syntax for this command is:

`set system name` `[string]`

`string`	Name string.

Set System Contact Command

Use the `set system contact` command to set the mib2 system contact MIB variable

The syntax for this command is:

`set system contact` `[string]`

`string`	Contact string

Set Interface Command

Use the `set interface command` to configure the in-band interfaces on the agent.

The syntax for this command is:

`set interface` `ib1 <vlan> <ip_addr[netmask]>`

`set interface` `sl0 <slip_addr> <dest_addr>`

`ib1`	Ethernet interface name
`sl0`	SLIP interface name
`ip_addr`	IP address of Cajun P120
`netmask`	Subnet mask
`vlan`	Agent VLAN number
`slip_addr`	SLIP address
`dest_addr`	IP address of the 2 ends

Note: The agent VLAN must be the same as the management station VLAN

Set Port Level Command

Use the `set port level` command to set the priority level of a port or range of ports on the switching bus. Packets traveling through a port set at normal priority are served only after packets traveling through a port set at high priority are served.

The Cajun P120 treats all the received BPDUs as high priority packets regardless of the Port-Priority and to the Port Tagging Mode. Unknown frames are always set to low priority.

The syntax for this command is:

set port level [slot_num/port_num][normal|high]

slot_num	Module number (always 1)
port_num	Number of the port on the module
normal	Set the port priority to regular
high	Set the port priority to high

Example

To set the priority level for port 2 on module 1 to high:

```
Console>(enable) set port level 1/2 high
Port 1/2 port level set to high.
Console>(enable)
```

Set Port Negotiation Command

Use the `set port negotiation` command to enable or disable the link negotiation protocol on the specified port. This command applies to ports on the 10/100 ports. When negotiation is enabled, the speed and duplex of the Fast Ethernet ports are determined by auto-negotiation. For Gigabit Ethernet ports, autonegotiation controls Flow Control mode (symmetric/disabled). If negotiation is disabled, the user can set the speed and duplex of the Fast Ethernet ports.

The syntax for this command is:

set port negotiation [slot_num/port_num][enable | disable]

slot_num	Module number (always 1)
port_num	Number of the port on the module
enable	Enable the autonegotiation protocol
disable	Disable the autonegotiation protocol

Example:

To disable link negotiation protocol on port 1, module 1:

```
Console>(enable) set port negotiation 1/1 disable
Console>(enable)
```

Set Port Enable Command

Use the `set port enable` command to enable a port or a range of ports.

The syntax for this command is: **`set port enable`** `[slot_num/port_num]`

`slot_num`	Module number (always 1)
`port_num`	Number of the port.

Example:

To enable port 3 on module 1:

```
Console>(enable) set port enable 1/3
Console>(enable)
```

Set Port Disable Command

Use the `set port disable` command to disable a port or a range of ports.

The syntax for this command is: **`set port disable`** `[slot_num/port_num]`

`slot_num`	Module number (always 1)
`port_num`	Number of the port.

Example:

```
Console>(enable) set port disable 1/10
Console>(enable)
```

Set Port Speed Command

Use the `set port speed` command to configure the speed of a port or range of ports. You can configure the speed of a Ethernet of Fast Ethernet interface only. You can configure Ethernet or Fast Ethernet interfaces on the Cajun P120 module to either 10 Mbps or 100 Mbps. In negotiation mode, the port's speed is determined by negotiation. An error message is generated if you attempt to set the speed type to 10 or 100 when negotiation is enabled.

The syntax for this command is:

`set port speed` `[slot_num/port_num][10|100]`

`slot_num`	Module number (always 1)
`port_num`	Number of the port on the module
`10|100`	Set a port speed to 10Mbps, 100 Mbps

Examples:

To configure port 2 on module 1 port speed to 10 Mbps:

```
Console>(enable) set port speed 1/2 10
Console>(enable)
```

Set Port Duplex Command

Use the `set port duplex` command to configure the duplex type of an Ethernet or Fast Ethernet port or range of ports.

You can configure Ethernet and Fast Ethernet interfaces to either full duplex or half duplex. The duplex status of a port in negotiation mode is determined by negotiation. An error message is generated if you attempt to set the transmission type of negotiation Fast Ethernet ports to half or full duplex mode.

The syntax for this command is:

`set port duplex` `[slot_num/port_num]{fdx|hdx}`

`slot_num`	Module number (always 1)
`port_num`	Number of the port on the module
`fdx`	Keyword to specify full-duplex transmission
`hdx`	Keyword to specify half-duplex transmission

Example:

To set port 1 on module 1 to full duplex:

```
Console>(enable) set port duplex 1/1 fdx
Port 1/1 set to full-duplex.
Console>(enable)
```

Set Port Flowcontrol Command

Use the `set flowcontrol` command to set the send/receive flow-control value for a particular Gigabit Ethernet or Fast Ethernet switch port.

This command is supported on 10/100 and Gigabit Ethernet switching modules.

The syntax for this command is:

`set port flowcontrol`
`{receive|send|both}][slot_num|port_num][off|on]`

`receive`	Indicate whether the port can receive flow control frames from a remote device
`send`	Indicate whether the local port can send flow control frames to a remote device
`slot_num`	Module number (always 1)
`port_num`	Number of the port on the module
`off`	Used with receive to turn off an attached device's ability to send flow-control packets to a local port. Used with send to turn off the local port's ability to send administrative status to a remote device.
`on`	Used with receive to require that a local port receives administrative status from a remote device. Used with send the local port sends administrative status to a remote device.

Examples:

These examples show how to use the set port flowcontrol command set:

```
Console>(enable) set port flowcontrol receive 1/1 on
Console>(enable) set port flowcontrol send 1/1 off
```

Note: When you disable the flow control setting of 10 Mbps or 100 Mbps ports, the change will not take effect until the switch is reset or powered off and on again.

Set Vlan Command

Use the `set vlan` command to set the Port-VLANs. If adding a new VLAN, the VLAN number must be within the range 1 to 3071.

The syntax for this command is: **`set vlan`** `vlan_num slot_num/port_num`

`vlan_num`	Number identifying the VLAN
`slot_num`	Module number (always 1)
`port_list`	Port number on the module belonging to the VLAN

Example:

To set VLAN 850 to include port 3 on module 1.

```
Console>(enable) set vlan 850 1/3
Console>(enable)
```

Clear Commands

Clear Port Mirror Command

Use the `clear port mirror` command to delete one or several port mirroring entries. The syntax of this command is:

`clear port mirror` [mod_num[/port_num]]

`mod_num`	(Optional) number of the module.
`port_num`	(Optional) number of the source or the destination port.

Example:

```
Console>(enable) clear port mirror 4/1
```

Mirroring both Rx and Tx packets from port 4/1 to port 5/12 is cleared.

```
Console>(enable)
```

Clear IP Route Command

Use the `clear ip route` command to delete IP routing table entries.

The syntax for this command is: **`clear ip route`** <0.0.0.0><gateway>

`gateway` IP address of the router

Example:

To delete the route table entries using the clear ip route command:

```
Console>(enable) clear ip route 0.0.0.0 192.1.1.1
Route deleted.
Console>(enable)
```

Clear SNMP Trap Command

Use the `clear snmp trap` command to clear an entry from the SNMP trap receiver table.

The syntax for this command is: **`clear snmp trap`** `<rcvr_addr | all>`

`rcvr_addr`	IP address or IP alias of the trap receiver (the SNMP management station) to clear.
`all`	Keyword that specifies every entry in the SNMP trap receiver table

Example:

```
Console>(enable) clear snmp trap 192.122.173.82
SNMP trap receiver deleted.
Console>(enable)
```

Clear Vlan Command

Use the `clear vlan` command to delete an existing VLAN from a management domain and return to its default. When you clear a VLAN, all ports assigned to that VLAN are assigned to the default VLAN # 1.

The syntax for this command is: **`clear vlan`** `[vlan_num]`

`vlan_num`	Number of the VLAN (range is 2 to 3071).

Example:

This example shows how to clear an existing VLAN (VLAN 4) from a management domain:

```
Console>(enable) clear vlan 4
This command will assign all ports on vlan 4 to their default
in the entire management domain
Do you want to continue (y/n) [n]? y
VLAN 4 deletion successful
Console>(enable)
```

Clear Cam Command

Use the `clear cam` command to delete all entries from the CAM table.

The syntax for this command is: **`clear cam`** `[vlan_num]`

`vlan_num`	(Optional) Number of the VLAN.

Example:

To clear the CAM table of VLAN 1:

```
Console>(enable) clear cam 1
CAM table entry cleared.
Console>(enable)
```

Reset Commands

Reset Command

Use the `reset` command to restart the Cajun P120 module.

```
Console>(enable) reset
This command will reset the module and may disconnect your
telnet session.
Do you want to continue (y/n) [n]? y
Resetting module ...
Console>(enable).
```

Reset System Command

Use the `reset system` command to return the Cajun P120 module parameters back to factory default settings.

```
Console>(enable) reset system
This command will reset the module and force factory default.
Do you want to continue (y/n) [n]? y
Console>(enable).
```

Show License Command

Use the `show license` command to display installed application Software Licenses installed.

The syntax for this command is: **`show license`**

Example:

```
Console> show license
 Application                License Key
------------   -----------------------------------
    SMON           0000 0000 0000 0000 0000 0000
```

Error Messages

You may receive the following error messages when using the CLI.

- `The privilege level timer has expired. You have been removed from the privilege level.`

  After 20 minutes without keyboard activity, you are automatically removed from the privilege level and returned to the non privilege level. To re-enter the privilege level use the login or flogin command and enter the password.
- `Set first parameter is wrong` *or* `set parameter(s) is wrong`

  The value you entered is not found in the list of valid values for this parameter. Check the list of valid values and check your spelling.
- `CANNOT perform SET, XXX value is wrong!`

  The value you entered is not within the valid range for this parameter (XXX is any parameter you tried to set, for example port speed).
- `This command can only be executed in the privilege level. Enter privilege level with ENABLE.`

  You must be in privilege level to use the command you entered. To enter privilege level use the login command and enter the password.

Specifications

Cajun P120 Switch

Physical

Height	2U (88 mm, 3.5”)
Width	482.6 mm (19”)
Depth	450 mm (17.7”)
Weight	7.3 kg (16.1 lbs)

Power Requirements

Input voltage	100 to 240 VAC, 50/60 Hz
BTU	The worst case for BTU for the Cajun P120 with an Expansion sub-module is ~273 BTU
Power dissipation	80 W

Environmental

Operating Temp.	0-40°C (32-105°F)
Rel. Humidity	5% to 95% non-condensing

Safety

- UL for US approved according to UL195O Std.
- C-UL(UL for Canada) approved according to C22.2 No.950 Std.
- CE for Europe approved according to EN 60950 Std.
- Overcurrent Protection: A readily accessible Listed safety-approved protective device with a 16A rating must be incorporated in series with building installation AC power wiring for the equipment under protection.

EMC Emissions

Emissions

Approved according to:

- US - FCC Part 15 sub part J, class A
- Europe - EN55022 class A

Immunity

Approved according to:

- EN 50082-1

Interfaces

- 24 x 10/100BASE-T ports with RJ-45 connectors.
- RS-232 for terminal setup, RJ-45 connector on front panel.
- RS-232 SLIP for modem connection, 9-pin D-type connector on back panel.

Standards Compliance

The Cajun P120 complies with:

- IEEE 802.3x Flow Control
- IEEE 802.1Q VLAN Standard (Tagging and priority)
- IEEE 8021.D Spanning Tree protocol
- IEEE 803.3z Gigabit Ethernet ports

MTBF

Table 7.3 Mean Time Between Failure (MTBF) for all Cajun P120 Configurations

	MTBF in Hours	MTBF in Hours (P120 Main Board + Expansion Sub-module)
P120 Main Board only	143,432	Not Applicable
X120S2	345,303 (only X120S2)	101,338
X120L2	345,303 (only X120L2)	101,338
X120S1	677,158 (only X120S1)	118,361
X120L1	677,158 (only X120L1)	118,361
X120F2	864,068 (only X120F2)	123,012
X120T8	1,315,846 (only X120T8)	129,334

Expansion Sub-modules

Gigabit Ethernet Expansion Sub-module

Table A.1 Gigabit Ethernet Expansion Units

Name	No. of Ports	Interface
X120S2	2	1000Base-SX
X120L2	2	1000Base-LX
X120S1	1	1000Base-SX
X120L1	1	1000Base-LX

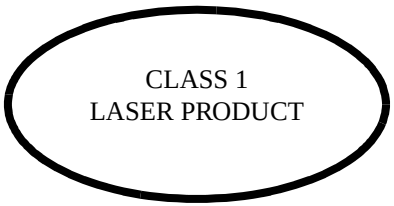
Laser Safety

The Cajun X120S1/X120S2 multi-mode transceivers and the Cajun X120L1/X120L2 single mode transceivers are Class 1 laser products.

They comply with IEC 825-1 and Food and Drug Administration (FDA) 21 CFR 1040.10 and 1040.11.

The transceivers must be operated under recommended operating conditions.

Laser Classification



Note: Class 1 lasers are inherently safe under reasonably foreseeable conditions of operation.

Caution: The use of optical instruments with this product will increase eye hazard.

Usage Restriction

The optical ports of the module must be terminated with an optical connector or a dust plug when not in use.

Laser Data

Cajun P120S1/2 Expansion Sub-modules

Wavelength: 850 nm
Output power dissipation: Max. 0.63W
Transmit power: Min. -9 dbm, Max. -4 dbm
Receive power: Min. -17 dbm, Max. 0 dbm

Cajun P120L1/2 Expansion Sub-modules

Wavelength: 1300 nm
Output power dissipation: Max. 0.68W
Transmit power (9 µm SMF): Min. -9.5 dbm, Max. -3 dbm
Transmit power (62.5 µm and 50 µm MMF): Min. -11.5 dbm, Max. -3 dbm
Receive power (9 µm SMF, 62.5 µm and 50 µm MMF): Min. -20 dbm, Max. -3 dbm

Fast Ethernet Fiber Expansion Sub-module

Table A.2 Fiber Fast Ethernet Expansion Sub-module

Name	No. of Ports	Interface
X120F2	2	100Base-FX

Ethernet/Fast Ethernet Expansion Sub-module

Table A.3 Ethernet/Fast Ethernet Expansion Sub-module

Name	Number of Ports	Interface
X120T8	8	10/100Base-T

GBIC Expansion Sub-module

The Cajun X120G2 Expansion sub-module is the GBIC (1.25 Gbit/s Gigabit Ethernet) Expansion sub-module for the Cajun P120 family of standalone switches.

Note: In order to use the Cajun X120G2 module, the Embedded S/W of the Cajun P120 switch must be Version 2.1 or higher. You can download the S/W from: http://www.lucentnetworks.com/

The X120G2 can be used either as a Gigabit Ethernet link or as a high Bandwidth backplane for connecting switches. The introduction of the GBIC interface to the Cajun P120 family presents an added value over the existing Gigabit Ethernet expansion sub-modules. You can insert any of the Lucent-approved GBIC transceivers into the X120G2 Expansion sub-module socket. This provides you with a highly modular and customizable Gigabit Ethernet interface. The GBIC transceivers are hot-swappable.

Safety Information

The multimode and single-mode GBIC transceivers are Class 1 Laser products. They comply with EN 60825-1 and Food and Drug Administration (FDA) 21 CFR 1040.10 and 1040.11.

The GBIC transceivers must be operated under recommended operating conditions.

Laser Classification

Note: Class 1 lasers are inherently safe under reasonably foreseeable conditions of operation.

Caution: The use of optical instruments with this product will increase eye hazard.

Usage Restriction

When a GBIC transceiver is inserted in the X120G2 Expansion sub-module but is not in use, then the Tx and Rx ports should be protected with an optical connector or a dust plug.

Lucent Approved GBIC Transceivers

Caution: All Lucent appoved GBICs are 5V. Do not insert a 3.3V GBIC.

Lucent supplies the following two GBIC transceivers for the Cajun P120 X120G2 Expansion Sub-modules. You can order these directly from your local Lucent representative using the PEC or COM Codes:

Type	Description	PEC Code	COM Code
GBIC SX Transceiver	Multimode Fiber 1000BaseSx (550 m)	4705-122	108659228
GBIC LX Transceiver	Single-mode Fiber 1000BaseLx (10 km)	4705-121	108659210

In addition, Lucent has tested and approved a number of GBIC transceivers from other manufacturers for use with the Cajun X120G2 Expansion sub-module. An up-to-date list can be found in Lucent Networks' World-Wide Web site at the following address: http://www.lucentnetworks.com/ Click on the "Supported Devices" icon.

Specifications

X120G2- LX GBIC Transceiver

A 9 µm or 10 µm single-mode fiber (SMF) cable may be connected to a 1000Base-LX GBIC port. The maximum length is 10 km (32,808 ft).

A 50 µm or 62.5 µm multimode (MMF) fiber cable may be connected to a 1000Base-LX GBIC port. The maximum length is 550 m (1,804 ft.) for 50 µm and 62.5 µm cable.

The LX transceiver has a Wavelength of 1300 nm, Transmission Rate of 1.25 Gbps and Input Power of 5V.

X120G2- SX GBIC Transceiver

A 50 µm or 62.5 µm multimode (MMF) fiber cable may be connected to a 1000Base-SX GBIC port. The maximum length is 500 m (1,640 ft.) for 50 µm cable and 220 m (722 ft.) for 62.5 µm cable.

The SX transceiver has a Wavelength of 850 nm, Transmission Rate of 1.25 Gbps and Input Power of 5V.

Agency Approval

The transceivers comply with:

- EMC Emission: US – FCC Part 15, Subpart B, Class A;
  Europe – EN55022 class A
- Immunity: EN50082-1
- Safety: UL for US UL 1950 Std., C-UL (UL for Canada) C22.2 No.950 Std., Food and Drug Administration (FDA) 21 CFR 1040.10 and 1040.11, and CE for Europe EN60950 Std. Complies with EN 60825-1.

MTBF

The Mean Time Between Failures (MTBF) for the Cajun P120 switch including the X120G2 Expansion Sub-module is 169,644 hours.

Software Download

If you wish to update the Cajun P120 software, you can either use the Cajun P120 Download Manager (strongly recommended) which is included on the Cajun P120 Standalone Manager CD or follow the Command Line Interface (CLI) TFTP download procedure outlined in this appendix.

A full description of the Cajun P120 Standalone Manager can be found on the Standalone Manager CD.

Download Procedure

Preparing the File for Download

The Cajun P120 software is distributed as a single file compressed using the "ZIP" format. Before downloading the software you need to uncompress the ZIP file to the computer from which you wish to download the Cajun P120 software.

To prepare the files uncompress the file, named P120.exe, into the folder:

```
C:\Lucent\Cajun P120\download\AgentCode
```

Download the Software Using Cajun P120 Download Manager

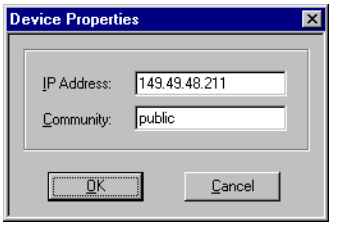
The P120 Download Manager allows you to download new software to the Cajun P120 from your Windows Network Management Station.

The Download Manager is part of the P120 Standalone Manager

CD.

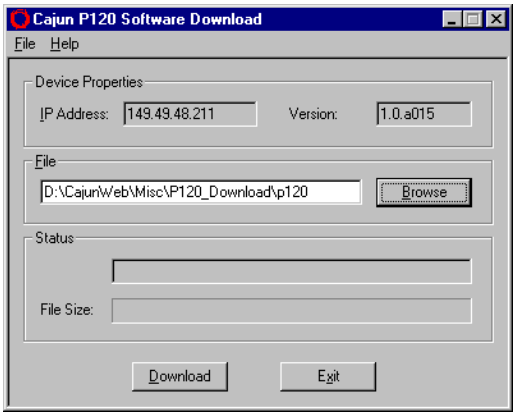
1 To run Download Manager, double click on its icon

in the Cajun P120 Manager Group. The following window opens:



2 Type the IP address of the desired Cajun P120 switch and the appropriate Community name and click OK (community names are used in the SNMP protocol to identify managers that are allowed to access the management information - the management station can only get answers to SNMP queries if it supplies the right community name). The following window appears, initially

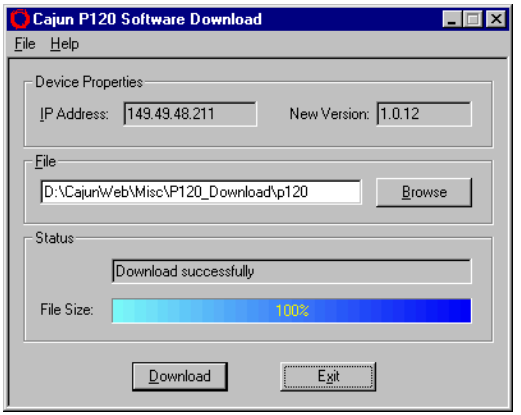
greyed while the Download Manager checks the current Cajun P120 software version.



This window shows the switch IP address, the current Software Version and download details.

3 Click Browse to select the download file (normally `C:\Lucent\Cajun P120\download\AgentCode\p120.exe`)

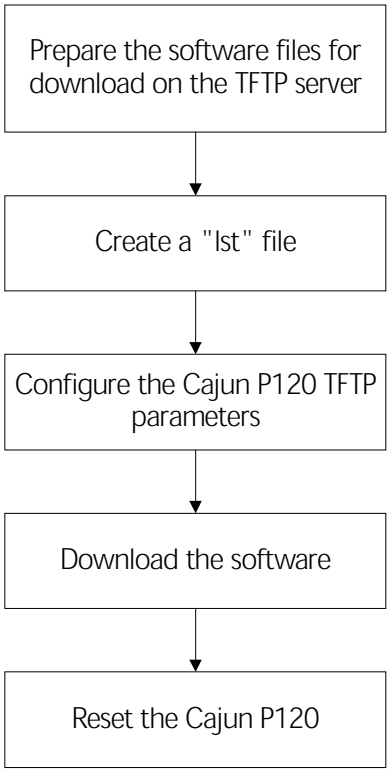
4 Click Download. Progress of the download is shown in the File Size box. Once the download is complete you can see the new software version displayed. On completion of the download, the P120 switch automatically boots to activate the new software. If for some reason the download was aborted, the switch will reboot and the old software version will be loaded from the backup Memory Bank. To download again press the Download button.



5 To download the new software to another Cajun P120 switch, open the File drop-down menu and choose the Change IP option.

Download the Software Using TFTP (via the CLI)

Figure B.1 TFTP Software Download Procedure - Overview


Prepare the software files for download on the TFTP server
Create a "lst" file
Configure the Cajun P120 TFTP parameters
Download the software
Reset the Cajun P120

Creating the ".lst" file

The ".lst" file is a text file that contains the directory where the Cajun P120 software is located. You will need to enter the name of this file when configuring the Cajun P120 TFTP parameters.

To create the .lst file, perform the following steps:

1 Create a text file (using an application such as Windows Notepad) containing the full path to the file name of the .exe file you uncompressed, e.g., **c:\P120\p120.exe**.

2 Save the file with the extension .lst, e.g., `P120.lst` in the target directory.

Configuring the Cajun P120 TFTP parameters

To configure the Cajun P120 TFTP parameters:

1. Establish a Telnet session with the Cajun P120 ("Establishing a Telnet Session (Ethernet port or modem)" on page 26 for details).
2. Log in to the Privileged level as follows:
   a. Type **login** at the `CajunP120>` prompt.
   b. Enter the password (the default value is lucent):
      Enter password: **lucent**
      The prompt should change to CajunP120-priv#.
3. Enter the TFTP configuration mode by typing the following:
   CajunP120-priv#set **TFTP**
4. Type **list** at the TFTP> prompt
5. You will be asked to enter the TFTP parameters one by one as follows (for a detailed explanation of the parameters, refer to "TFTP Configuration Group (TFTP)" on page 64):
   tftp>tftp-op [limited]? Ensure that the value is set to "limited"
   tftp>tftp-ip [149.49.42.58]? Enter the IP address of the TFTP server.
   tftp>tftp-filename [c:\p120\p120.lst]? Enter the name of the lst file which you prepared in the previous step, including the full path (e.g., **c:\p120\p120.lst**).
6. Once you have entered all the parameters, the CajunP120-priv# prompt will be displayed. Type **WRITE** to save the parameters. The following message will appear on the display:
   Writes this configuration into the memory. Dynamic parameters will take affect immediately. All other parameters will only take affect after powering the switch off/on.
   Save the new configuration (y/n)?
   Enter **Y** to save the new configuration.

Start the Software Download

Now that the Cajun P120 is configured, you can start the download procedure:

1. Run the TFTP server on the computer with the Cajun P120 files.
2. Type the command **tftp-cmd start** at the CLI prompt. This starts the download.
3. If you wish, you can monitor the download status by typing the command **status** at the CLI prompt.
   Once the download has finished, you should receive the following message:
   FTP transfer has finished successfully

Reset the Cajun P120

In order to complete the download process, you need to reset the Cajun P120 before proceeding.

Cajun P120 Standalone Manager

The Cajun P120 Manager provides the following:

- Device Configuration - Viewing and modifying the different device configurations.
- Port RMON- Viewing graphical representations of the traffic on the ports of the Cajun P120 Switch.
- Virtual LANs - Viewing and editing Virtual LAN information.
- Link Aggregation Groups (LAGs) - Viewing and editing LAG information.
- Software Redundancy - Setting software redundancy for ports in a Cajun P120 Switch.
- Port Mirroring - Setting up port mirroring for ports in a Cajun P120 Switch.
- Trap Managers Configuration - Viewing and modifying the Trap Managers Table.
- Switch Connected Addresses - View devices connected to selected ports.
- Software Download via the Cajun P120 Download Manager.
- Layer 2 Security
- BUPS Management

System Requirements

Minimum hardware and operating system requirements are:

- Windows™ 95 or NT™ 4.0 or higher
- Pentium™ 200-Mhz-based, computer with 64 Mb of RAM (Pentium-II recommended)
- Minimum screen resolution of 1024 x 768 pixels
- 24 Mb of free hard disk space.

Installation

To install the Cajun P120 Standalone Manager:

1 We recommend that you close all unnecessary applications currently running on your PC.
2 Insert the Cajun P120 Standalone Manager CD in your PC's CD drive.
3 In Win95 or Windows NT, click Start and select Run.
4 Enter the path to the CD drive and the filename `Setup.exe` and click OK.
5 Follow the on screen instructions to install the Cajun P120 Manager.

Documentation and Online Help

The Standalone Manager comes with a detailed User's Guide including a Glossary of Terms and an overview of Data Communications concepts.

Software Download

The P120 Download Manager allows you to download new software to the Cajun P120 from your Windows Network Management Station.

The Download Manager is part of the P120 Standalone Manager

CD.

To run Download Manager, double click on its icon

in the Cajun P120 Manager Group.

For a full description of the Download Manager and the Download procedure see Appendix B in this User Guide.

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